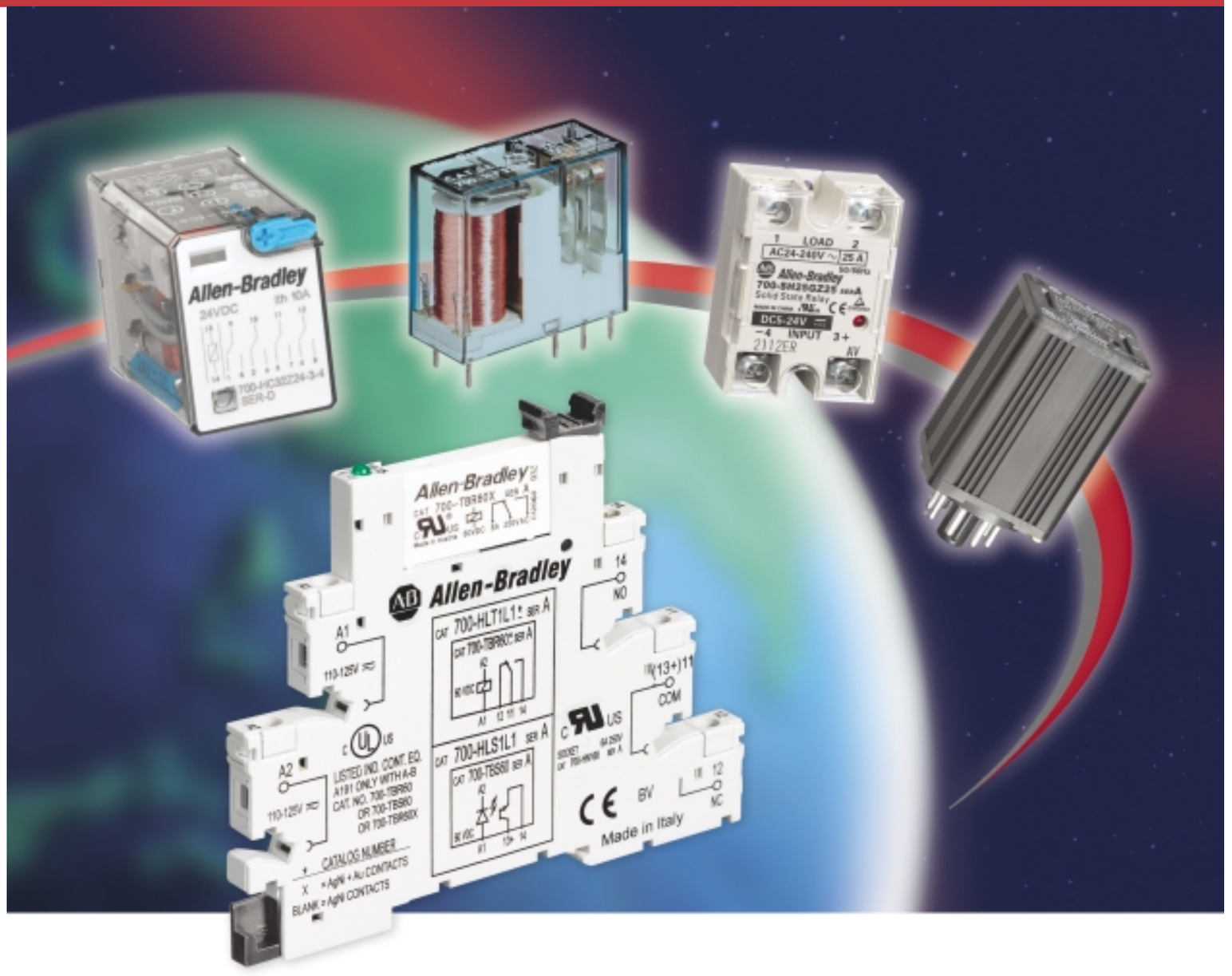
Allen-Bradley

Relays and Timers – Selection Guide

Rockwell Automation



Relays and Timers – Reliable Global Solutions

Selection Guide

Allen-Bradley

Allen-Bradley
Reliance Electric
Dodge
Rockwell Software
Rockwell Automation

Solid State Relays

The New Solid State Applications Solution

Rockwell Automation has broadened its Allen-Bradley relay product line to include six new solid-state relays (SSRs). The solid-state relay logic input control levels are compatible with many industrial controllers available in today's market such as PLCs and temperature controllers. The switching design of the solid-state relay uses no moving parts or contacts that can wear out. This is one of the reasons they will perform in a variety of harsh environments.

Long Life Expectancy

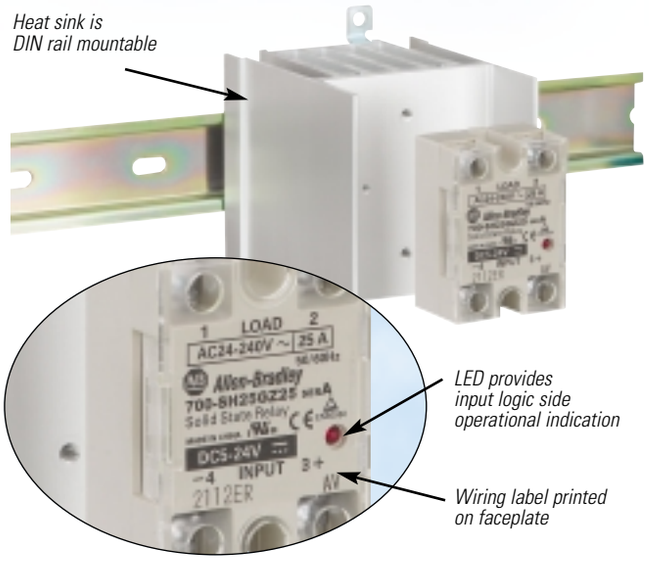
Solid-state relays use electronic instead of mechanical devices for load switching while providing a life cycle expectancy of approximately 100,000 energized hours or 11.4 years. This reduces product replacement and downtime.

Low Maintenance

There are no moving parts or contacts to wear out or be affected by vibration and shock. Maintenance dollars, parts replacement, and downtime are reduced drastically, if not eliminated altogether.

Reduced Power Costs

The solid-state relay typically requires 25 times less power than electromechanical relays and also generates less heat. This means the panel can typically be smaller, reducing panel space requirements.



Flexibility

Plug-in style SSRs (700-SA, SC, SF and SK) are compatible with Allen-Bradley 700-HN sockets and retainer clips. In addition, the 700-SA SSR is compatible with the 700-HT1 multi-function, multi-range timer module while the 700-SC SSR is compatible with the new 700-AT1 or 700-AT2 timer modules. The flexibility and compatibility with these relay accessories support a wide range of applications, while reducing spare parts inventories.

See Interposing Relays on Inside Back Cover

General Information

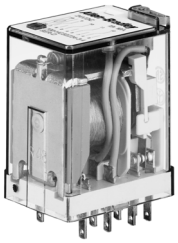
- Quick Selection Table — Page 6
- Contact Switching Data — Page 17
- Surge Suppression Solutions — Page 21
- Low Energy Selection Criteria — Page 25
- Catalog Number Index — Page 30

Solid-State Relays

- Bulletin 700-SA Tube Base Relay — Page 31
- Bulletin 700-SC "Ice Cube" Relay — Page 37
- Bulletin 700-SE Flat Pack Relay — Page 42
- Bulletin 700-SF Square Base Relay — Page 47
- Bulletin 700-SH "Hockey Puck" Relay — Page 51
- Bulletin 700-SK "Slim Line" Relay — Page 58

General Purpose Relays

- Bulletin 700-HA Tube Base Relay — Page 63
- Bulletin 700-HB Square Base Relay — Page 75
- Bulletin 700-HD Flange Mount Square Base Relay — Page 81
- Bulletin 700-HF Square Base Relay — Page 89



Interposing/Isolation Relays

- Bulletin 700-HC Miniature "Ice Cube" Relay — Page 85
- Bulletin 700-HK "Slim Line" Relay — Page 98
- Bulletin 700-HL Terminal Block Relay — Page 102
- Bulletin 700-HP PCB "Pin" Style Relay — Page 107

Latching Relay

- Bulletin 700-HJ Magnetic Latching Relay — Page 94

Power Relays

- Bulletin 700-HG Power Relay — Page 111
- Bulletin700-HHF Flange Mount Power Relay — Page 114

DIN Rail Mounted Timing Relays

- Bulletin 700-FE Economy Timing Relay — Page 116
- Bulletin 700-FS High Performance Timing Relay — Page 120

Socket Mounted Timing Relays

- Bulletin 700-HNC Miniature Timing Relay — Page 127
- Bulletin 700-HNK Ultra-Slim Timing Relay — Page 133
- Bulletin 700-HR Dial Timing Relay — Page 139
- Bulletin 700-HS Timing Relay — Page 151
- Bulletin 700-HT Timing Relay — Page 156
- Bulletin 700-HV Timing Relay — Page 161

Digital Timing/Counting Relays

- Bulletin 700-HX Multifunction Digital Timing Relay — Page 165
- Bulletin 700-HXM Preset Counter/Timing Relay — Page 174

Industrial Relays

- Bulletin 700-CF Control Relay — Page 186
- Bulletin 700-M Miniature Control Relay — Page 205
- Bulletin 700-P Heavy-Duty Relay — Page 211

Industrial Safety Control Relays

- Bulletin 700S-CF Safety Control Relay — Page 197
- Bulletin 700S-P Heavy-Duty Safety Control Relay — Page 202
- Bulletin 700-ZP Self-Monitoring Relay Assembly — Page 226

Industrial Timing Relays

- Bulletin 700-PS Solid-State Timing Relay — Page 235
- Bulletin 700-RTC Solid-State Timing Relay — Page 238

Quick Selection Table for Solid-State Relays

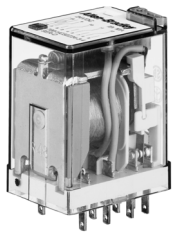
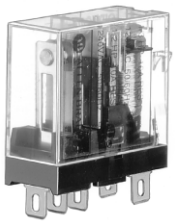
Bulletin No.	**700-SH**	**700-SE**	**700-SC**	
Type	Hockey Puck	Flat Pack	Miniature, Ice Cube Socketed	
Features	Panel/DIN Mount, High Current, Protective Cover, LED Status Option	Panel/DIN Mount, Low Profile	Compatible w/700-HN103 or 128 socket, LED Status & Zero-cross AC Switching Options	
Load Type	AC (47…63 Hz)	AC (47…63 Hz)	AC (47…63 Hz)	DC
Load Voltage Range	24…240V AC, 200…480V AC ❶	75…264V AC	75…264V AC	3…52.8V DC or 3…125V DC
Load Current Max. (Continuous)	6 A/40 A ❷	5 A/20 A ❷	3 A	3A @ 48V, or 2A @ 110V
Max Leakage Current to Load	5 mA @ 100V, 10 mA @ 200V, 20 mA @ 400V	5 mA @ 100V, 10 mA @ 200V	5 mA @ 100V AC, 10 mA @ 200V AC	5 mA @ 50V DC, or 0.1mA @ 100V DC
Zero Cross Load Switching	Yes	Yes (optional)	Yes (optional)	N/A
Equivalent Electromechanical Relay Contact Arrangement	Form A	Form A	Form A	
Rated Control (Input) Voltage	5…24V DC, 100…120V AC, 200…240V AC	5V DC, 12V DC, 24V DC	5…24V DC, 100…110V AC, 200/220V AC	5…24V DC
LED Indicator	Yes	**No**	Yes (optional)	Yes (Opt) for 48V DC
Mounting Method	Panel w/o heat sink, Panel or DIN w/heat sink	Panel w/o heat sink, Panel or DIN w/heat sink	Panel or DIN w/socket	
Dielectric Strength	2500V AC 50/60 Hz 1 min	2000V AC 50/60 Hz 1 min	1500V AC 50/60 Hz 1 min.	
Certification	cURus, CE ❶, TÜV	cURus, CE, TÜV	cURus, CE, VDE	
Max. Ambient Operating Temperature	-30…80°C (no condensation)	-30…80°C (no condensation)	-30…80°C (no condensation)	
Page Number	51	42	37	

❶ 200…480V load voltage range units do not have CE approval.
❷ With heat sink

Bulletin No.	**700-SF**		**700-SA**		**700-SK**			
Type	Square Base, Socketed		Tube Base, Socketed		Slim Line, Socketed			
Features	Compatible w/700-HN116 socket, LED status, zero-cross AC switching		Compatible w/700-HN100, 125,108, and 202 socket, LED status, zero-cross switching		Compatible w/700-HN121 socket. Supports Input (sensor) module or Output (SSR) module			
Load Type	AC (47…63 Hz)	DC	AC (47…63 Hz)	DC	Output Module		Input Module	
					AC (47…63 Hz)	DC	AC (47…63 Hz)	DC
Load Voltage Range	75…264V AC	3 … 52.8V DC	75…264V AC	3 …125V DC	75 … 264V AC	4 … 60V DC, 40 … 200V DC	Field Input: 60… 264V AC	Field Input: 6.6… 32V DC
Load Current Max. (continuous)	3 A		5 A	3A	2 A	2A @ 60V, 1.5A @ 200V	Supply Current: 0.1 … 100 mA	Supply Current: 0.1 … 100 mA
Max. Leakage Current to Load	5mA @ 100V AC, 10mA @ 200V AC	5mA @ 50V DC	5 mA @ 100V 10 mA @ 200V	5 mA @ 125V	1.5 mA	1 mA	5 µA	5 µA
Zero Cross Load Switching	Yes (optional)	N/A	Yes	N/A	Yes (optional)	N/A	No	N/A
Equivalent Electromechanical Relay Contact Arrangement	Form A		Form A		Form A			
Rated Control (input) Voltage	4V DC or 24V DC		5…24V DC	5…24V DC	5 … 24 V DC	5 … 24 V DC	5 … 24V DC	5 … 24V DC
LED Indicator	Yes		Yes		Yes			
Mounting Method	Panel or DIN w/socket		Panel or DIN w/socket		Panel or DIN w/socket			
Dielectric Strength	1500V AC 50/60Hz 1 min.		1500V AC 50/60Hz 1 min.		4000V AC 50/60 Hz 1 min			
Certification	cURus, CE, VDE		cURus, CE, VDE		cURus, CE, TÜV			
Max. Ambient Operating Temperature	-30…80° C (no condensation)		-30 … 80°C (no condensation)		-30 … 80°C (no condensation)			
Page Number	47		31		58			

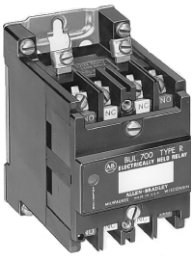
Quick Selection Table For Relays

Bulletin No.	**700-HA**	**700-HB**	**700-HD**	**700-HF**
Type	General Purpose Relay	General Purpose Relay	General Purpose Relay	General Purpose Relay
Features	Pin Style Terminals,Standard ON/OFF Flag Indicator, Electrical Schematic on Face, Clear Cover for Visual Inspection, Optional Push-to-test and Manual Override, Optional LED	Blade Style Quick Connect Terminals, Standard ON/OFF Flag Indicator, Electrical Schematic on Face, Clear Cover for Visual Inspection, Optional Push-to-test and Manual Override, Optional LED	Flange-mounted, Blade-style Quick Connection Terminals, Clear Cover for Visual Inspection	Square Base, Plug-in Quick Connect Solder Terminals, Optional Push-to-test and LED
Contact Ratings				
Contact Form	DPDT, 3PDT	DPDT, 3PDT	DPDT, 3PDT	DPDT, 3PDT, 4PDT
Contact Type	Single, Bifurcated	Single	Single	Single
Contact Material	AgNi, AgNi + Gold	AgCdO	AgCdO	AgCdO
Max. operating current under resistive load	10 A	15 A	15 A	10 A
Min. permissible load	700-HA 10V 50 mA 700-HAB 6V 30 mA 700-HAX 6V 1 mA	10V 50 mA	10V 50 mA	10V 50 mA
Coil Ratings				
Coil Voltage	**AC:** 6V, 12V, 24V, 48V, 110V, 120V, 208V, 230V, 240V, 277V **DC:** 6V, 12V, 24V, 36V, 48V, 60V, 80V, 110V, 125V, 140V, 220V	**AC:** 6V, 12V, 24V, 120V, 240V **DC:** 6V, 12V, 24V, 48V, 110V	**AC:** 6V, 12V, 24V, 120V, 208V, 240V **DC:** 6V, 12V, 24V, 48V, 110V	**AC:** 6V, 12V, 24V, 120V, 240V **DC:** 6V, 12V, 24V, 48V, 110V
Permissible Coil Voltage Variation	80…110% of Nominal Voltage at 50 Hz 80…110% of Nominal Voltage at 60 Hz 80…110% of Nominal Voltage at DC	80…110% of Nominal Voltage at 50 Hz 80…110% of Nominal Voltage at 60 Hz 80…110% of Nominal Voltage at DC	80…110% of Nominal Voltage at 50 Hz 80…110% of Nominal Voltage at 60 Hz 80…110% of Nominal Voltage at DC	85…110% of Nominal Voltage at 50 Hz 85…110% of Nominal Voltage at 60 Hz 80…110% of Nominal Voltage at DC
Electrical Ratings				
Dielectric Withstand Voltage	Pole-to-Pole: 2000V Contact to Coil: 2000V Contact to Frame: 2000V	Pole-to-Pole: 2500V Contact to Coil: 4000V Contact to Frame: 2500V	Pole-to-Pole: 2500V AC Contact to Coil:4000V AC Contact to Frame: 2500V AC	Pole-to-Pole: 1500V AC Contact to Coil:1500V AC Contact to Frame: 1500V AC
Electric Service Life (cycles)	100,000 minimum	100,000 minimum	100,000 minimum	200,000 minimum, 500,000 minimum (DPDT)
Reference				
Certifications	CE, cULus, cURus, ABS, IMQ, RINA	CE, cULus, cURus, ABS, IMQ, RINA	CE, UR, CSA, ABS, IMQ, RINA	CE, UR, CSA
Socket Cat. No(s).	700-HN100, 700-HN101, 700-HN125, 700-HN126,700-HN202 700-HN203	700-HN153 700-HN154	—	700-HN116, 700-HN138, 700-HN139
Page Number	63	75	81	89

			
700-HC	**700-HK**	**700-HL**	**700-HP**
Interposing/Isolation Relay	Interposing/Isolation Relay	Interposing/Isolation Relay	Interposing/Isolation Relay
Pin Style Terminals,Standard ON/OFF Flag Indicator, Electrical Schematic on Face, Clear Cover for Visual Inspection, Optional Push-to-test and Manual Override, Optional LED	Optional Pilot Light, Built-in Retainer Clip, Low Switching Capacity	Ideal for PLC Interfaces, Built-in Coil Surge Protection, Fully Assembled Relay/Sockets, Standard LED, Relay or Solid-state Output Optional: Leakage Current Suppression Solution	PCB “Pin Style” Mounting, 5 mm Pin spacing
2PDT, 4PDT	SPDT, DPDT	SPDT (1 c/o) 1 N.O. (SSR)	2PDT
Single, Bifurcated	Single	Single	Single
AgNi, AgNi + Gold	AgCdO, AgCd+Gold	AgSnO	AgNi, AgNi + Gold
10 A (2PDT) 7 A (4PDT)	5 A (DPDT), 10 A (SPDT)	6 A (SPDT), 2 A (SSR)	8 A
10V 1 mA (Gold), 10V 10 mA (Silver)	10V 50 mA (Silver), 5V 10 mA (Gold)	12V 6 mA (72 mW) Silver 8V, 2.5 mA (20 mW) Gold	5V 5 mA (50 mW) Gold, 5V 5 mA (300 mW) Silver
AC: 6V, 12V, 24V, 120V, 240V **DC:** 6V, 12V, 24V, 48V, 110V	**AC:** 6V, 12V, 24V, 120V, 240V **DC:** 6V, 12V, 24V, 48V, 110V	**AC:** 12V, 24V, 48V, 110V, 120V, 230V, 240V **DC:** 12V, 24V, 48V, 125V, 230V, 240V	**AC:** 6V, 12V, 24V, 120V, 240V **DC:** 6V, 12V, 24V, 48V, 110V
80…110% of Nominal Voltage at 50 Hz 80…110% of Nominal Voltage at 60 Hz 80…110% of Nominal Voltage at DC	85…110% of Nominal Voltage at 50 Hz 85…110% of Nominal Voltage at 60 Hz 80…110% of Nominal Voltage at DC	85…110% of Nominal Voltage at 50 Hz 85…110% of Nominal Voltage at 60 Hz 80…110% of Nominal Voltage at DC	80…110% of Nominal Voltage at 50 Hz 80…110% of Nominal Voltage at 60 Hz 73…150% of Nominal Voltage at DC
Pole-to-Pole: 1600V Contact to Coil: 1600V Contact to Frame: 1600V	Pole-to-Pole: 1500V AC Contact to Coil: 1500V AC Contact to Frame: 1500V AC	Pole-to-Pole: — Contact to Coil: 4000V AC Contact to Frame: 1500V AC	Pole-to-Pole: 2000V AC Contact to Coil: 5000V AC
100,000 minimum	100,000 minimum	100,000 minimum	100,000 minimum
CE, cULus, cURus, IMQ, ABS, RINA	CE, UL, UR, CSA	CE, cURus, cULus, ABS, IMQ	CE, cULus, cURus, IMQ, ABS, RINA
700-HN103, 700-HN128, 700-HN104	700-HN121 700-HN122	—	700-HN123
85	98	102	107

Quick Selection Table For Relays

Bulletin No.	**700-HG**	**700-HHF**	**700-HJ**
Type	Power Relay	Power Relay	Magnetic Latching Relay
Features	Panel Mount with Screw Terminals, Optional Magnetic Blowouts for Switching DC Loads, Optional Snap Action Switch	Flange Mounted, Optional LED	Socket Mounted, Ideal for Lighting Applications
Contact Ratings			
Contact Form	SPST-N.O.-DM, SPDT, DPST-N.O., DPDT	SPST-NO-DM, DPDT, 3PDT	SPDT, DPDT (Single or Dual Coil)
Contact Type	Single	Single	Single
Contact Material	AgCdO	AgCdO	AgCdO
Max. operating current under resistive load	30 A	20 A (3PDT), 25 A (DPDT), 30 A (SPDT)	10 A
Min. permissible load	10V 50 mA	10V 50 mA 10V 100 mA (3PDT)	10V 50 mA
Coil Ratings			
Coil Voltage	**AC:** 24V, 120V, 240V, 277V, 480V **DC:** 12V, 24V, 48V, 110V, 220V, 250V	**AC:** 24V, 120V, 240V **DC:** 6V,12V, 24V	**AC:** 24V, 120V, 240V **DC:** 12V, 24V,
Permissible Coil Voltage Variation	85…110% of Nominal Voltage at 50 Hz 85…110% of Nominal Voltage at 60 Hz 80…110% of Nominal Voltage at DC	85…110% of Nominal Voltage at 50 Hz 85…110% of Nominal Voltage at 60 Hz 80…110% of Nominal Voltage at DC	85…110% of Nominal Voltage at 50 Hz 85…110% of Nominal Voltage at 60 Hz 80…110% of Nominal Voltage at DC
Electrical Ratings			
Dielectric Withstand Voltage	Pole-to-Pole: 2200V AC Contact to Coil: 2200V AC Contact to Frame: 2200V AC	Pole-to-Pole: 2200V AC Contact to Coil: 2200V AC Contact to Frame: 1600V AC	Pole-to-Pole: 1500V AC Contact to Coil: 1500V AC Contact to Frame: 1500V AC
Electric Service Life (cycles)	100,000 minimum	100,000 minimum	100,000 minimum
Reference			
Certifications	CE, UL, CSA	CE, UR, CSA	CE, UR, CSA
Socket Cat. No(s).	—	—	700-HN153 700-HN154
Page Number	111	114	94

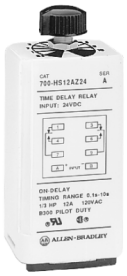
					
Bulletin No.	**700-CF and 700S-CF**	**700-M/MB**	**700-P and 700S-P**	**700-PK**	**700-R**
Type	Control Relay	Miniature Control Relay	Heavy-Duty Control Relay	Heavy-Duty Control Relay	Sealed Switch
Features	Mechanically Linked Contacts, Timer and Latch Operations, Switch up to 600V AC and DC 700S-CF for Safety Circuits	Smallest Size, Long Life, Low Power Consumption, Mechanically Linked Contacts, Switch up to 600V AC and DC	Five Contact Styles, Mechanically Linked Contacts, Timer and Latch Options, Switch up to 600V AC and DC 700S-P for Safety Circuits	Five Contact Styles, Mechanically Linked Contacts, Timer and Latch Options, Switch up to 600V AC and DC	Hazardous Location Ratings, Long Life in Dirty Environment, Timer and Latch Options, Switch 600V AC, 300V DC
Contact Form	4-12 Poles Double Break	4-8 Poles Double Break	2-12 Poles Double Break	2-12 Poles Double Break	2-8 Poles
Contact Type	Cross Stamp, Bifurcated	X-Mark and Bifurcated	Bifurcated Double Break	Double Break	Sealed Switch
Contact Material	Silver, Gold	Silver-Copper	Silver-Nickel	Silver-Cadmium Oxide	Sealed Switch
Electrical					
Max. Current AC Resistive	25 A (Relay) 10 A (Adder Deck)	15 A	10 A	20 A	5 A
Min. Load	24V 10 mA (Silver) 12V 8 mA (Gold)	17V, 30 mA (700-M) 17V 5 mA (700-MB)	10V, 50 mA 5V 1 mA (sealed switch)	1 mA, 5V with Bulletin 700-CPR	1 mA, 5V
Coil Voltage	12…600V AC 9…250V DC	24…480V AC 12…220V DC	24…600V AC 6…600V DC	24…600V AC 6…600V DC	24…240V AC 24…250V DC
Coil Voltage Pickup	85…110% AC Coils, 80…110% DC Coils	85…110% AC Coils, 80…110% DC Coils	85…110% AC Coils, 80…110% DC Coils	85…110% AC Coils, 80…110% DC Coils	85…110% AC Coils, 80…110% DC Coils
Dielectric withstand	2640V	2640V	2640V	2640V	2640V
Reference					
Electric Service Life (cycles)	1.2 million at 10 A 120V AC	800K at 10 A 120V AC	1.5 million at 10 A 120V AC	1.5 million at 10 A 120V AC	1.5 million at 5 A 120V AC
Certifications	UL, CSA, CE	UL, CSA, CE	UL, CSA, CE	UL, CSA, CE	UL, CSA, CE
Sockets	DIN Rail or Panel Mount	DIN Rail or Panel Mount	Panel or Rail Mount	Panel or Rail Mount	Panel or Rail Mount
Page Number	186, 197	205	211 and 226	213	229

Quick Selection Table For Timing Relays

Bulletin No.	**700-FE**	**700-FS**	**700-HR52, -HRP, -HRS, -HRT, -HRV**	**700-HRM/-HRC**	**700-HRF**
Type	DIN Rail Timer	DIN Rail Timer	Multifunction Timer	ON-Delay Timer	Twin Timer
Features	Only 17.5 mm wide, 6 A Contact Rating, Multifunction or Single Function	22.5 mm wide 8 A Contact Rating, Multifunction or Single Function	Dial Timing Relays 5 A Contact Rating Multiple Programmable Timing Ranges Tube Base Pin Style Terminals Multi-Voltage Inputs Timed Contacts and Instantaneous Contacts Transistor Outputs Single Function and Multi-Function 7 Different Operating Modes	Dial Timing Relays 5 A Contact Rating Multiple Programmable Timing Ranges Tube Base Pin Style Terminals Multi-Voltage Inputs Timed Contacts and Instantaneous Contacts Transistor Outputs Single Function and Multi-Function	Independent ON and OFF settings 14 time ranges 8-pin models available Dial Timing Relays UL508
Control Outputs: Time Limit Instantaneous	1 N.O. or SPDT Timed	SPDT, DPDT, 2 N.O. + 1 common	DPDT Timed, Transistor SPDT Timed/Instantaneous	DPDT Timed, Transistor SPDT Timed/Instantaneous	DPDT Timed
Operation Modes:	ON-Delay OFF-Delay One Shot Repeat Cycle-Pulse Fleeting OFF-Delay Pulse Converter Star Delta	11 Different Timing Modes	ON-Delay OFF-Delay One Shot Repeat Cycle Off Start Repeat Cycle On Start Signal On/Off-Delay ON-Delay One Shot	ON-Delay	Repeat Cycle Off Start Repeat Cycle On Start
Time Range	0.05 s…10 h	0.05s…60 h	0.05 s…300 h	0.05 s…300 h	0.05 s…300 h
Supply Voltage	24V AC/DC 110…240V AC 24V…48V AC/DC 24V…240V AC	12V DC 24V…48V DC 24V…240V AC	12…48V DC 24…48V AC 100…240V AC 100…125V DC	12…48V DC 24…48V AC 100…240V AC 100…125V DC	12V DC 24V AC/DC 48…125V DC 100…240V AC
Contact Rating at 120V AC	6 A	8 A	5 A	5 A	5 A
Certifications	cUR, UL, CE	cUR, UL, CE	cURus, CE, ACA	cURus, CE, ACA	cURus, CE, ACA
Socket Cat. No(s).	—	—	700-HN100 **OR** 700-HN101 700-HN125 **OR** 700-HN126	700-HN100 700-HN125	700-HN100 700-HN125
Page Number	116	120	139	139	139

Bulletin No.	**700-HRY**	**700-HRQ**	**700-HNC**	**700-HNK**
Type	Star-Delta Timer	True OFF-Delay timer	Miniature Timer	Ultra-Slim Timer
Features	A wide star-time range (up to 120 s) Star-delta transfer time range (up to 0.5 s) UL Recognized	Dial Timing Relays Long power OFF-Delay Times 11-pin and 8-pin models are available UL Recognized	Four Different Operating Modes DIN Rail Mount with Socket Pin Configuration Same as Bulletin 700-HC Relay	Ultra-Slim Timing Relay 4 Different Operating Modes Three Operating Voltages DIN Rail Mount with Socket Pin Configuration Same as 700-HK Relay
Control Outputs: Time Limit Instantaneous	SPST (Star, Delta) Timed SPST - NO Instantaneous	DPDT Timed	4PDT	SPDT, DPST-NO
Operation Modes:	Star-Delta	True OFF-delay Timer True OFF-delay Timer w/reset	ON-Delay One Shot Repeat Cycle Off Start Repeat Cycle On Start	ON-Delay One Shot Repeat Cycle Off Start Repeat Cycle On Start
Time Range	0.5 s…120 s	0.05 s…12 min.	0.1 s…10 h	0.1 s…10 h
Supply Voltage	100…120V AC 200…240V AC	48V DC 24V AC/DC 100…240V AC 100…125V DC	12V DC 24V AC/DC 48…125V DC 100…240V AC	12V DC 24V DC 24V AC
Contact Rating at 120V AC	5 A	5 A	5 A	5 A
Certifications	cURus, CE, ACA	cURus, CE, ACA	cURus, CE, ACA	cURus, CE, VDE, ACA
Socket Cat. No(s).	700-HN100 700-HN125	700-HN100 **OR** 700-HN101 700-HN125 **OR** 700-HN126	700-HN103 700-HN128	700-HN121 700-HN122
Page Number	140	140	127	133

Quick Selection Table For Timing Relays

					
Bulletin No.	**700-HT**	**700-HV**	**700-HS**	**700-HX**	**700-HXM**
Type	Tube Base Timing Relay	Repeat Cycle Timing Relay	Square Base Timing Relay	Digital Timer	Digital Counter/Timer
Features	Pin Style Terminals Single Range or Fixed Timers Available as -ON or -OFF Delays	Pin Style Terminals, Single Range Timer, Repeat Cycle	Blade Style Terminals, Single Range or Fixed Timers Available as ON or OFF Delay	Digital Timer 5 A Contact Rating Negative Transmissive LCD Display 10 Functions or Modes Environmentally Friendly—Flash Memory, No Battery NEMA B300 Rated NEMA 4/ IP66 DIN or Panel Mount Capable	World's Smallest Compact Preset Timer Built-in Prescaling for Counter Operation Finger Protection Terminal Block to Meet VDE0106/P100 Panel Surface Compatible with NEMA 4/IP66 Six-language Instruction Manual Provided Environmentally Friendly—Flash Memory, No Battery Negative Transmissive LCD Display
Control Outputs: Time Limit Instantaneous	DPDT	DPDT	DPDT	SPDT	SPDT
Timing Operation Modes:	ON-Delay OFF-Delay	Repeat Cycle	ON-Delay OFF-Delay	Signal ON-Delay 1 and 2 Signal OFF-Delay One Shot Repeat Cycle Off Start Repeat Cycle On Start Signal On/Off-Delay Power ON-Delay 1 and 2 Twin Timer Cumulative	ON-Delay Repeat Cycle Signal Off-Delay One Shot Accumulative On/Off-duty Adjustable-Repeat Cycle Counter Multi Mode
Time Range	0.1 s…30 min.	0.1 s…30 min.	0.1 s…180s.	0.05 s…300 h	0…9999 h
Supply Voltage	12V DC 24V DC 24V AC 120V AC 240V AC	24V DC 24V AC 120V AC 240V AC	12V DC 24V AC 24V DC 120V AC	12…24V DC 24V AC 100…240V AC	24V DC
Contact Rating at 120V	10 A	10 A	12 A	5 A	5 A
Certifications	UR, CSA, CE	UR, CSA, CE	UR, CSA, CE	cURus, CE, NEMA 4/IP66, ACA	cURus, CE, NEMA 4/IP66, ACA
Socket Cat. No(s.)	700-HN100 **OR** 700-HN101 700-HN125 **OR** 700-HN126	700-HN100 700-HN125	700-HN153 700-HN154	700-HN100 700-HN125	—
Page Number	156	161	151	165	174

Bulletin No.	**100-FPT**	**700-PT**
Type	Pneumatic Timing Module (for 700-CF relays)	Pneumatic Time-Delay Timer
Features	Timing function works independent of the supply voltage. Relay contact operates instantaneously. Continuous adjustment range.	Continuous carrying current of 10 A, Contacts of N.O. and N.C. Open Type Without Enclosure. Mounts on 700-P relay.
Control Outputs: **Time Limit** **Instantaneous**	2 timed contacts	1 open, 1 closed
Timing Operation Modes:	ON-Delay OFF-Delay	ON-Delay OFF-Delay
Time Range	0.3…180 s	0.1…60 s
Supply Voltage	110…240V 50/60 Hz 110…250V DC	24…600V AC 6…600V DC
Page Number	186	216

Quick Selection Table For Industrial Timing Relays

Bulletin No.	**100-ETA**	**196-MT3**	**700-RTC**	**700-PS**
Type	Solid-state Timing Module (for 700-CF relays)	Solid-state Timing Module (for 700-M relays)	Solid-state Timing Relay	Solid-State Timer
Features	Changes all contacts on Bulletin 100-C contactors and Bulletin 700-CF control relays into timed contacts.	35 mm DIN Rail Mounting Adapter	Timed and instantaneous contacts. Sealed contacts for harsh environments and hazardous locations.	Self-contained or external potentiometer. Continuous carrying current of 5 A AC or DC. Stand alone or mount on 700-P or 700-R.
Control Outputs: **Time Limit** **Instantaneous**	4 timed contacts on relay	4 instantaneous to timed contacts	8 output contacts	3 output contacts
Timing Operation Modes:	ON-Delay OFF-Delay	ON-Delay	ON-Delay OFF-Delay	ON-Delay OFF-Delay
Time Range	0.1…180 s	0.1…30 s	0.05 s…64 min.	0.1…120 s
Supply Voltage	110…240V 50/60 Hz 24V DC 110…250V DC	110…250V AC/DC 50/60 Hz	24V AC 110…120V AC 220…240V AC 24V DC 120V DC 240V DC	110…120V 50/60 Hz
Page Number	186	206	238	235

Contact Data Tables

	Relay Type	Contact Arrangement	Contact Style	Contact Material	NEMA Pilot Duty ❶	AC and DC Switching Capability
IEC	700-CF	Up to 8 form X or 8 form Y	cross stamped	Ag	A600 P600	24V DC AC
IEC	700-CFB	Up to 8 form X or 8 form Y	bifurcated gold	AgCuAu	—	12V
IEC	700-MB	Up to 8 form X or 8 form Y	bifurcated	AgCu	A300 Q300	17V DC AC
IEC	700-M	Up to 8 form X or 8 form Y	single “X”mark	AgCu	A600 Q600	17V DC AC
NEMA	700-CPR ❷	N.O. or N.C. cartridge	single	sealed	—	5V DC AC (0.2 A (0.5 A Max.) Max.) (150V) (30V)
NEMA	700-P	Up to 12 form X or 8 form Y	bifurcated	NiAg	A600 P600	10V DC AC
NEMA	700-PK	Up to 12 form X or 8 form Y	single	AgCdO	2X A600 2X P600	10V DC AC (20 A Lighting Load)
NEMA	700-PH	Up to 6 form X or 4 form Y	tandem	AgCdO	A600 P600	10V DC (35 A Lighting AC Load)
NEMA	700-R	Up to 8 form A or form B	sealed sw.	W	B300 C600 P300	5V AC DC
NEMA	700-RM	Up to 8 form A or form B	sealed sw.	W	B300 C600 P300	5V AC DC
NEMA	700-RTC	Up to 4 form A or form B	sealed sw.	W	B600 P300	5V AC DC
NEMA	700S-CF	Up to 8 form X or 8 form Y	cross stamped	Ag	A600 P600	24V AC
NEMA	700S-P	Up to 12 form X or 8 form Y	bifurcated	NiAg	A600 P600	10V AC

1 mA	20 mA	50 mA	100 mA	1 A	3 A	5 A	10 A	20 A	25 A	30 A	35 A

❶ NEMA contact rating chart is on page 19.
❷ Cartridge for 700-P relays for low energy switching.

Contact Data Tables, Continued

	Relay Type	Contact Arrangement	Contact Style	Contact Material	NEMA Pilot Duty ❶	AC and DC Switching Capability
						1 mA 10 mA 50 mA 100 mA 1 A 3 A 5 A 10 A 20 A 25 A 30 A 35 A
General Purpose	700-FE	1 N.O.	single	AgCdO	D300	10V AC DC (24V Max.)
	700-FS	1, 2 form C	single	AgCdO	B300	10V AC DC (24V Max.)
	700-HA	2, 3 form C	single	AgNi	B300	10V AC DC (24V Max.)
	700-HAB	2, 3 form C	bifurcated	AgNi	—	6V AC DC (24V Max.)
	700-HAX	2, 3 form C	bifurcated	Au/AgNi	—	6V AC DC (24V Max.)
	700-HB	2, 3 form C	single	AgNi	B300	10V AC DC (24V Max.)
	700-HC14	4 form C	single	Ag/Au	C300 Q300	10V AC DC (30V Max.)
	700-HC22	2 form C	single	AgNi	B300 Q300	10 V AC DC
	700-HC24	4 form C	single	AgNi	C300 Q300	10 V AC DC (30V Max.)
	700-HD	2, 3 form C	single	AgCdO	B300	10V AC DC (24V Max.)
	700-HF	2, 3, 4 form C	single	AgCdO	B300	10V AC DC (30V Max.)
	700-HG	1 form X, 1 form C, 2 form A, 2 form C	single	AgCdO	A600	10V AC DC (28V Max.)
	700-HG with Blowouts	1 form X	single	AgCdO	A600	10V AC DC (110V Max.)
	700-HG with Blowouts	1, 2 form C, 2 form A	single	AgCdO	A600	10V AC DC (110V Max.)
	700-HHF45	1 form X	single	AgCdO	A600	10V AC DC (28V Max.)
	700-HHF62	2 form C	single	AgCdO	B600	10V AC DC (28V Max.)
	700-HHF73	3 form C	single	AgCdO	B300	10V AC DC (28V Max.)
	700-HJ	1, 2 form C	single	AgCdO	—	10V AC DC (24V Max.)
	700-HK36	1 form C	single	AgCdO	B300	10V AC DC (30V Max)
	700-HKX36	1 form C	single	Au/AgCdO	—	10V AC DC (30V Max)
	700-HK32	2 form C	single	AgCdO	B300	5V AC DC (30V Max)
	700-HKX32	2 form C	single	Au/AgCdO	—	5V AC DC (30V Max)

Contact Data Tables, Continued

General Purpose

Relay Type	Contact Arrangement	Contact Style	Contact Material	NEMA Pilot Duty ❶	AC and DC Switching Capability
					1 mA 10 mA 50 mA 100 mA 1 A 3 A 5 A 10 A 20 A 25 A 30 A 35 A
700-HLS	Solid-State 1 N.O.	—	—	—	3V — AC/DC
700-HLT	1 Form C	single	AgSnO	B300 R300	12V — 6 A AC/DC
700-HLT_ _X	1 Form C	single	AgSnO	B300 R300	8V — 6 A AC/DC
700-HP	2 Form C	single	AgNi	B300 Q300	5V (300 mW) — 8 A AC/DC
700-HPX	2 Form C	single	AgNi + Gold	—	5V (50 mW) — 8 A AC/DC
700-HS	2 Form C	single	AgCdO	B300	10V — AC DC (30V Max.)
700-HT	2 form C	single	AgCdO	B300	10V — AC DC (30V Max.)

❶ NEMA contact rating chart is on page 19.

NEMA Ratings and Test Values for AC Control Circuit Contacts at 50 or 60 Hz

NEMA Contact Rating Designation	Thermal Continuous Test Current [A]	Maximum Current [A] 120V Make	120V Break	240V Make	240V Break	480V Make	480V Break	600V Make	600V Break	VA Make	VA Break
A150	10	60	6.00	—	—	—	—	—	—	7200	720
A300	10	60	6.00	30	3.00	—	—	—	—	7200	720
A600	10	60	6.00	30	3.00	15	1.50	12	1.20	7200	720
B150	5	30	3.00	—	—	—	—	—	—	3600	360
B300	5	30	3.00	15	1.50	—	—	—	—	3600	360
B600	5	30	3.00	15	1.50	7.5	0.75	6	0.60	3600	360
C150	2.5	15	1.50	—	—	—	—	—	—	1800	180
C300	2.5	15	1.50	7.5	0.75	—	—	—	—	1800	180
C600	2.5	15	1.50	7.5	0.75	3.75	0.375	3	0.30	1800	180
D150	1.0	3.60	0.60	—	—	—	—	—	—	432	72
D300	1.0	3.60	0.60	1.8	0.30	—	—	—	—	432	72
D600	0.5	1.80	0.30	—	—	—	—	—	—	216	36
2X A300	20	120	12	60	6.00	—	—	—	—	14400	1440
2X A600	20	120	12	60	6.00	30	3.00	24	2.40	14400	1440

NEMA Ratings and Test Values for DC Control Circuit Contacts

NEMA Contact Rating Designation	Thermal Continuous Test Current [A]	Maximum Current [A] 5…28V	125V	250V	301…600V	Make or Break at 300V or less [VA]
N150	10	10	2.2	—	—	275
N300	10	10	2.2	1.1	—	275
N600	10	10	2.2	1.1	0.40	275
P150	5.0	5.0	1.1	—	—	138
P300	5.0	5.0	1.1	0.55	—	138
P600	5.0	5.0	1.1	0.55	0.20	138
Q300	2.5	2.5	0.55	0.27	0.11	69
Q600	2.5	2.5	0.55	0.27	0.11	69
2X P600	10	10	2.2	1.1	0.40	275

Solid-State Relays Data Tables

	Relay Type	Equivalent EM Relay Contact Configuration	Load Voltage	Zero-Cross	Load Switching Device	Maximum AC and DC Switching Capability (1 mA, 10 mA, 50 mA, 100 mA, 1 A, 3 A, 5 A, 10 A, 20 A, 25 A, 30 A, 35 A, 40 A)
Solid-State	700-SA	Form A	AC	Yes	Triac	
			DC	N/A	Transistor	
	700-SC	Form A	AC	Yes	Triac	
			DC	N/A	Transistor	(2 A)
	700-SE ❶	Form A	AC	Yes	Triac	
	700-SF	Form A	AC	Yes	Triac	
			DC	N/A	Transistor	
	700-SH ❶	Form A	AC	Yes	Thyristor or Triac	
	700-SKO	Form A	AC	Yes	Triac	(2 A)
			DC	N/A	Transistor	

❶ Requires a heat sink to reach maximum current value

NEMA Definitions for Contact Arrangements

Form "A" Contacts

A Form A contact arrangement is one that has single-pole, single-throw, normally open contacts. The function of this arrangement is to close a circuit when actuated.

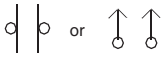
Form "B" Contacts

A Form B contact arrangement is one that has single-pole, single-throw, normally closed contacts. The function of this arrangement is to open a circuit when actuated.

Form "C" Contacts

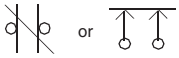
A Form C contact arrangement is one that has single-pole, double-throw contacts with three terminals - one for normally open, one for normally closed, and one common. The function of this arrangement is to transfer a circuit when actuated.

Form "X" Contacts



A Form X contact arrangement is one which has single-pole, single-throw, normally open double-make contacts. The function of this arrangement is to close a circuit when actuated.

Form "Y" Contacts



A Form Y contact arrangement is one that has single-pole single-throw normally closed double-break contacts. The function of this arrangement is to open a circuit when actuated.

Form "Z" Contacts

A Form Z contact arrangement is one that has single-pole, double-throw, contacts with four terminals — two for normally open and two for normally closed. The function of this arrangement is to open one circuit and close the other.

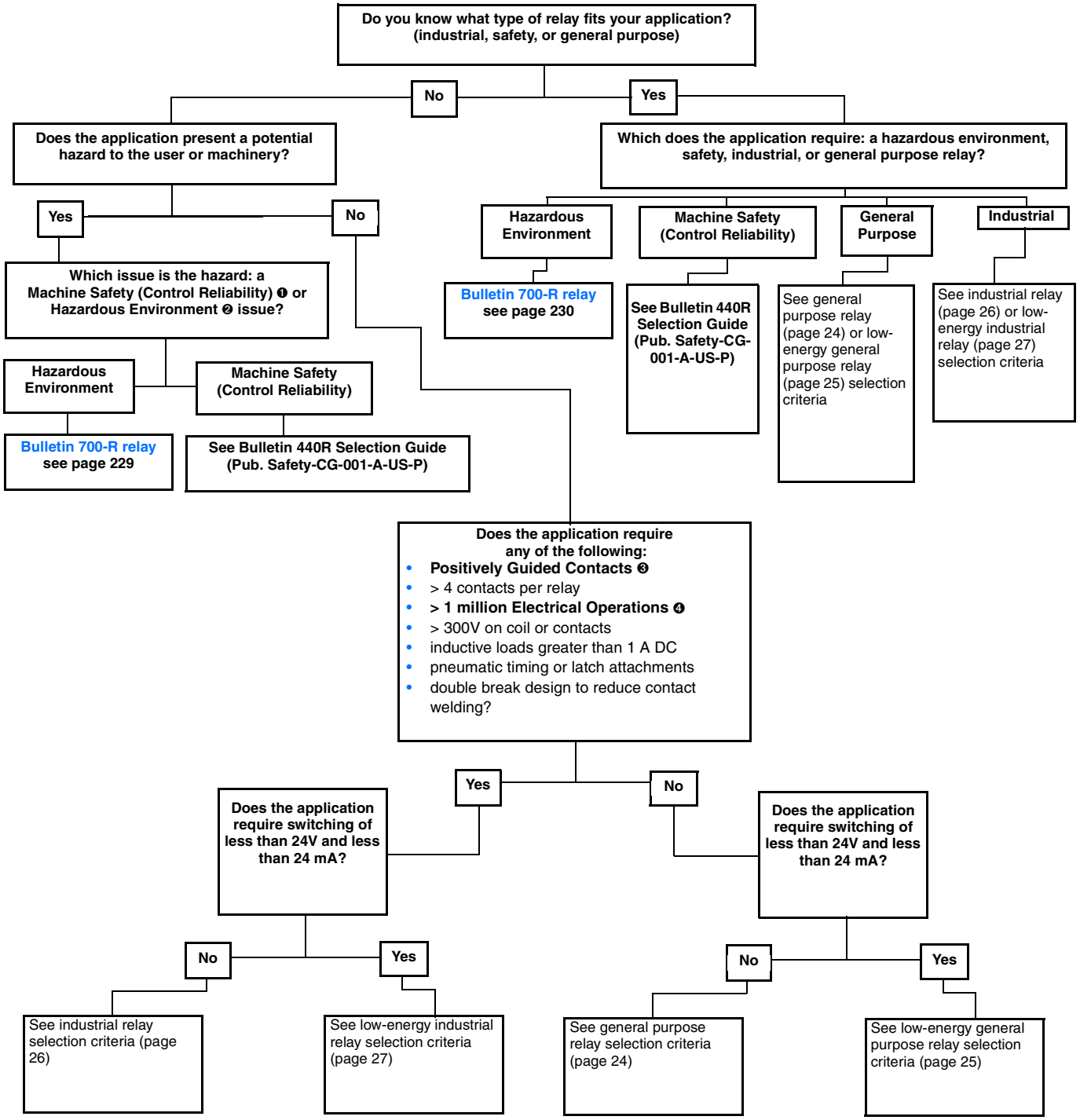
Surge Suppression Information

	Cat. No (s).	For use with	Suppression Technique	Max. Relay Contact Dropout Time	Max. Transient Voltage Relative to System Voltage
	700-ADL1	700-HC (6…24V DC)	Diode + LED	3X	—
	700-ADL1R	700-HB, -HP (6…24V DC)	Diode + LED	3X	—
	700-ADL2	700-HC (28…60V DC)	Diode + LED	3X	—
	700-ADL2R	700-HB, -HP (28…60V DC)	Diode + LED	3X	—
	700-ADL3	700-HC (110…220V DC)	Diode + LED	3X	—
	700-ADL3R	700-HB, -HP (110…220V DC)	Diode + LED	3X	—
	700-AR1	700-HB, -HC, -HP (6…24V AC/DC)	RC	No Effect	—
	700-AR2	700-HB, -HC, -HP (110…240V AC/DC)	RC	No Effect	—
	700-AV1R	700-HB, -HC, -HP (6…24V AC)	Varistor + LED	No Effect	—
	700-AV3R	700-HB, -HC, -HP (110…240V AC)	Varistor + LED	No Effect	—
See 700-CF Relay	**700-CF built-in**	—	Diode	—	6…10X
	100-FSC	100C, 700-CF	R-C Ckt	No Effect	3X
	100-FSV	100C, 700-CF	MOV	No Effect	—
	100-FSD	100C, 700-CF	Diode	70…95 ms	6…10X
	100-JE	100C, 700-CF	Diode	5X	6…10X
See 700-M Relay	**700-M built-in**	—	Diode	—	6…10X
	199-MSMA	100-M, 700-M	R-C Ckt	No Effect	3X
	199-MSMV	100-M, 700-M	MOV	No Effect	—
	199-MSMD	100-M, 700-M	Diode	5X	6…10X
	700-N5	700-P, 700-N	RC	No effect	3X
	700-N24	700-P, 700-N	RC	No effect	3X
See 700-R Relay	**700-R built-in**	—	Diode	—	6…10X
	199-FSMA1, FSMA2	700-P, 700-H, 700-CF, 700-M, 700-DCR	RC	No effect	3X
	199-FSMA9, 10, 11	700-P, 700-H, 700-CF, 700-M, 700-DCR	MOV	No effect	—
	199-FSMZ	700-P, 700-H, 700-CF, 700-M, 700-DCR	Diode	5X	—

Surge Suppression Information, Continued

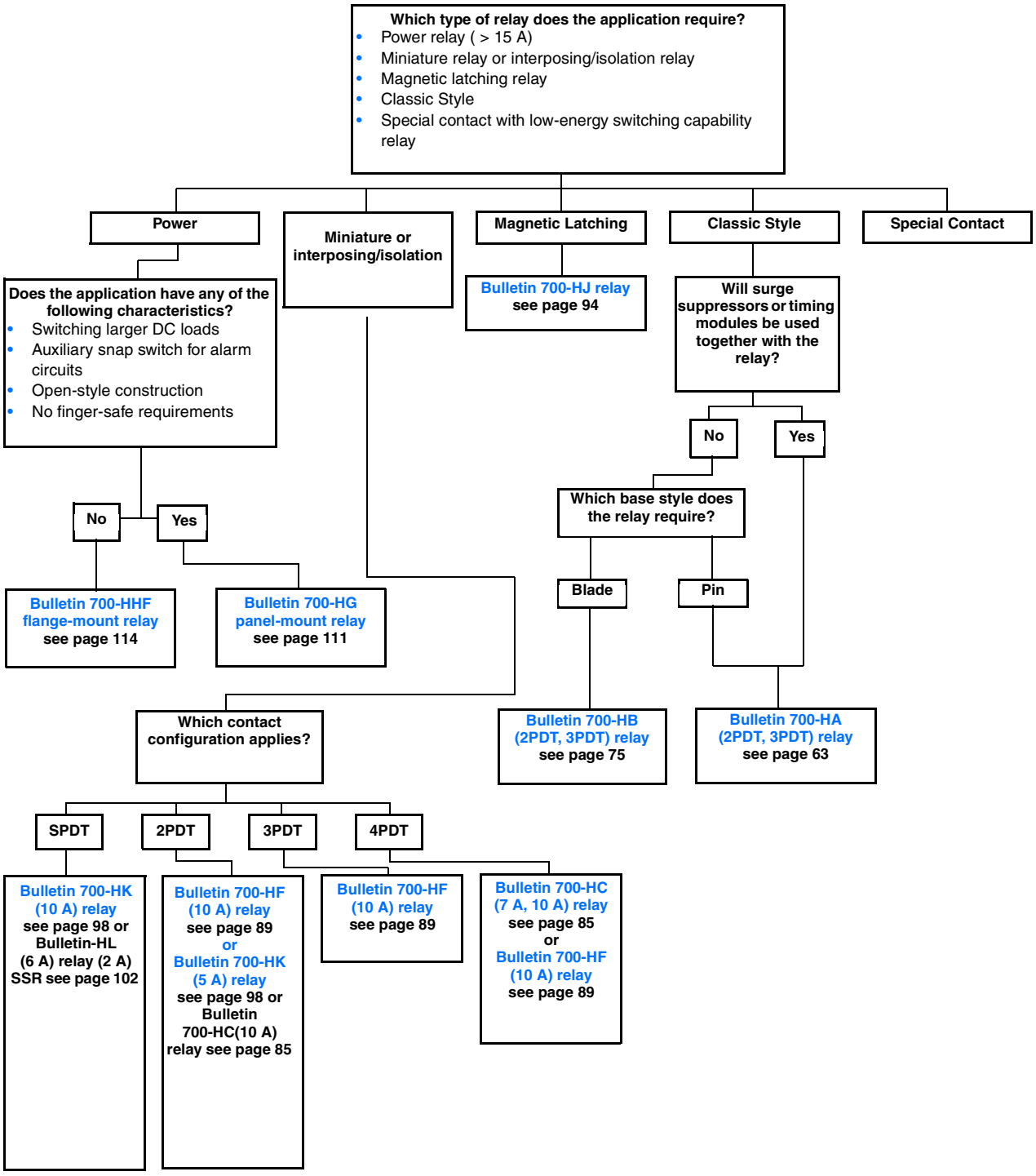
	Cat. No (s.)	For use with	Suppression Technique	Max. Relay Contact Dropout Time for 4-pole	Max. Transient Voltage Relative to System Voltage
	700-HSV1	700-HA	MOV	No effect	6…10X
	700-HSV2			—	
	700-HSV3			—	
	700-HSMD		Diode	—	—

General Purpose Relay Selection Criteria

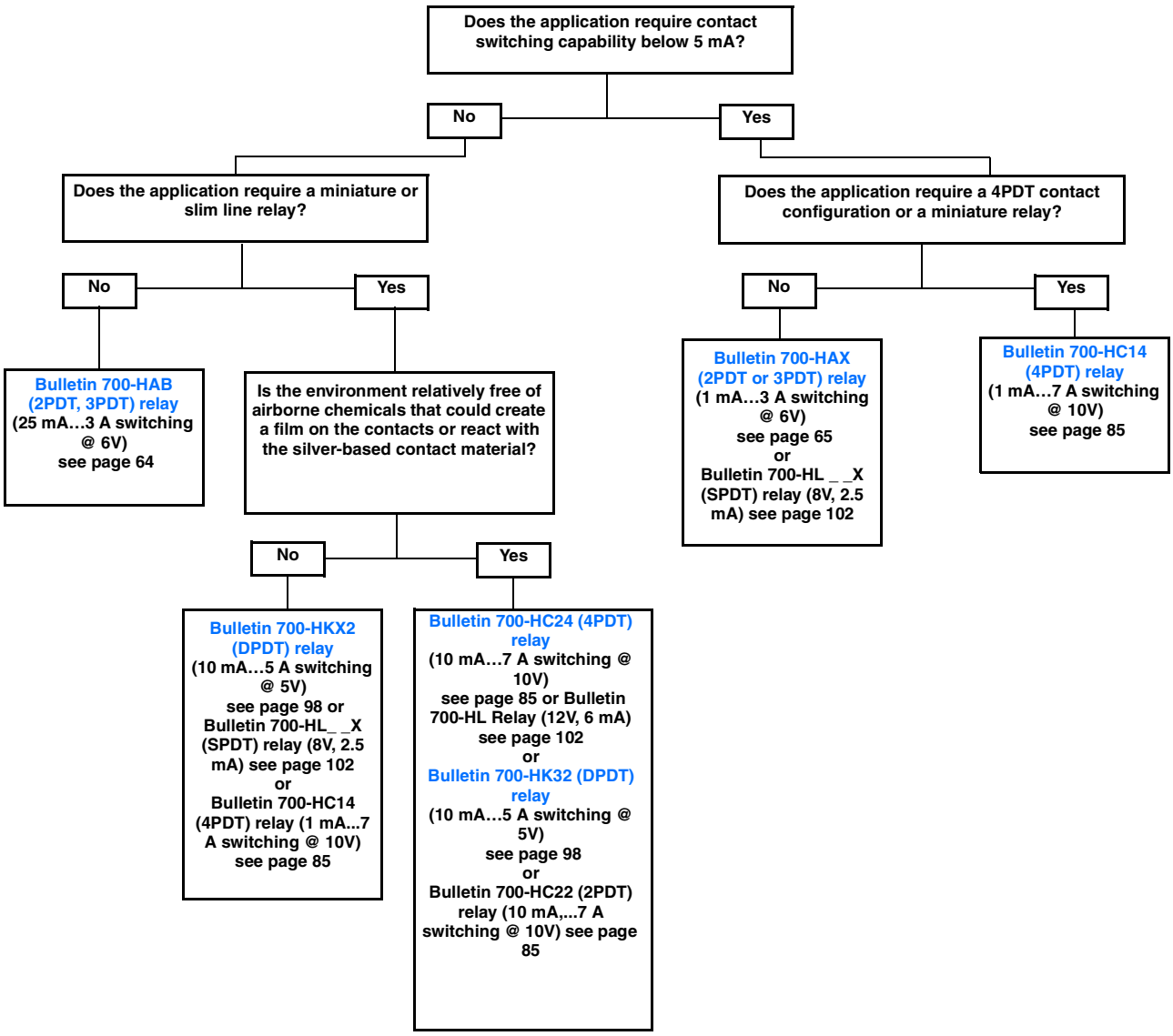

Do you know what type of relay fits your application? (industrial, safety, or general purpose)
No
Yes
Does the application present a potential hazard to the user or machinery?
Which does the application require: a hazardous environment, safety, industrial, or general purpose relay?
Yes
No
Hazardous Environment
Machine Safety (Control Reliability)
General Purpose
Industrial
Which issue is the hazard: a Machine Safety (Control Reliability) ❶ or Hazardous Environment ❷ issue?
Bulletin 700-R relay see page 230
See Bulletin 440R Selection Guide (Pub. Safety-CG-001-A-US-P)
See general purpose relay (page 24) or low-energy general purpose relay (page 25) selection criteria
See industrial relay (page 26) or low-energy industrial relay (page 27) selection criteria
Hazardous Environment
Machine Safety (Control Reliability)
Bulletin 700-R relay see page 229
See Bulletin 440R Selection Guide (Pub. Safety-CG-001-A-US-P)
Does the application require any of the following:
• Positively Guided Contacts ❸
• > 4 contacts per relay
• > 1 million Electrical Operations ❹
• > 300V on coil or contacts
• inductive loads greater than 1 A DC
• pneumatic timing or latch attachments
• double break design to reduce contact welding?
Yes
No
Does the application require switching of less than 24V and less than 24 mA?
Does the application require switching of less than 24V and less than 24 mA?
No
Yes
No
Yes
See industrial relay selection criteria (page 26)
See low-energy industrial relay selection criteria (page 27)
See general purpose relay selection criteria (page 24)
See low-energy general purpose relay selection criteria (page 25)

❶ Machine Safety (Control Reliability) — A single component failure within a device or system shall not prevent the normal stopping action from taking place shall prevent successive machine motion unless the failure is removed.
❷ Hazardous Environment — An environment where a sealed contact is necessary to prevent potential ignition of liquids, gases, vapors, combustibles, or fibers.
❸ Contacts that are all mechanically linked to allow detection of a welded N.O. contact by examining a N.C. contact.
❹ Electrical Operations — If the relay is required to perform over 1,000,000 operations at a load current close to the relay current rating, the best choice is typically an industrial relay. For many loads, an industrial relay will provide over 1,000,000 operations. If the relay is required to perform over 1,000,000 operations at a load current that is a small fraction of the relay current rating and none of the other characteristics apply, a general purpose relay may suffice.

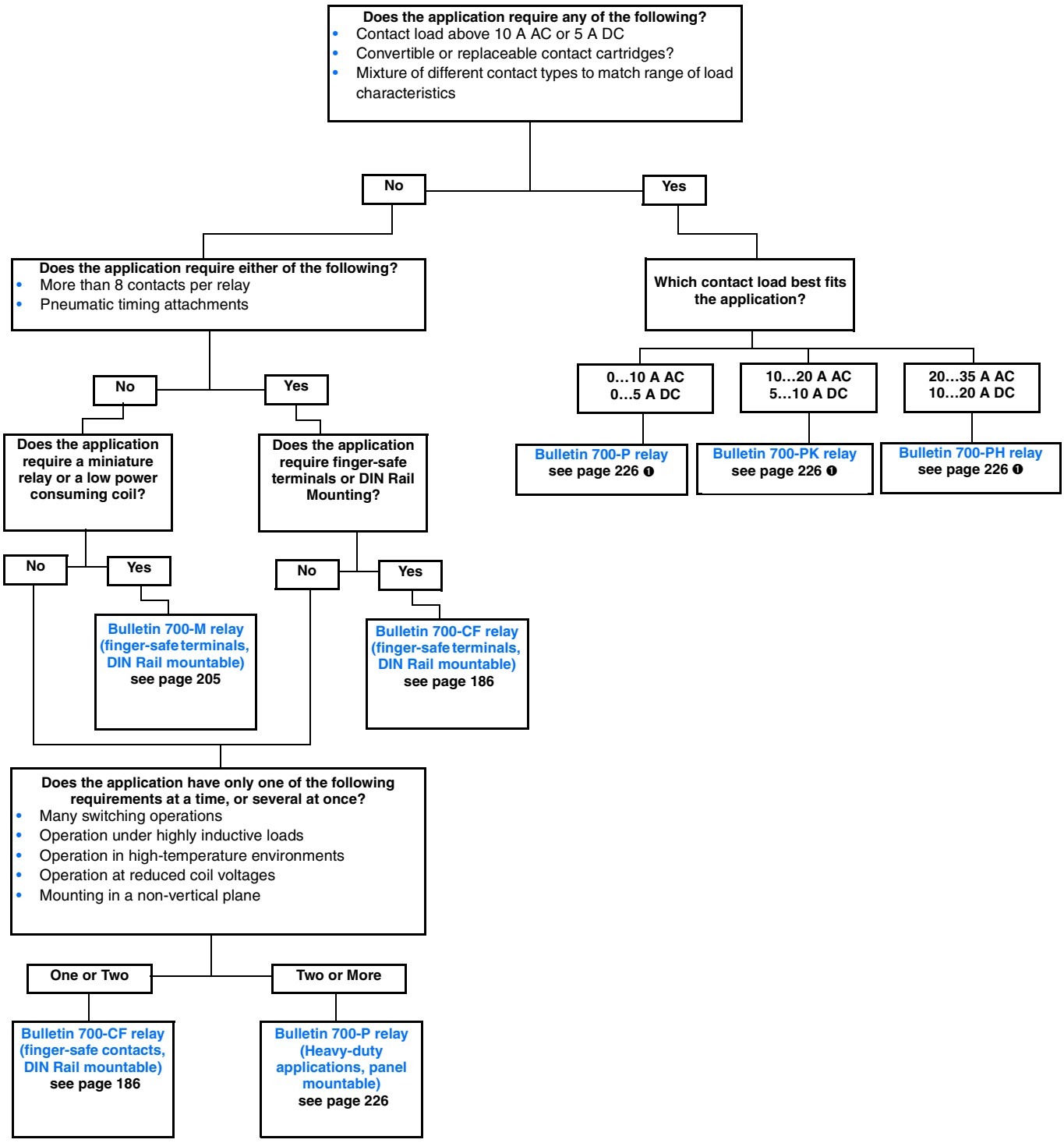
General Purpose Relay Selection Criteria, Continued


Which type of relay does the application require?
• Power relay (> 15 A)
• Miniature relay or interposing/isolation relay
• Magnetic latching relay
• Classic Style
• Special contact with low-energy switching capability relay
Power
Miniature or interposing/isolation
Magnetic Latching
Classic Style
Special Contact
Does the application have any of the following characteristics?
• Switching larger DC loads
• Auxiliary snap switch for alarm circuits
• Open-style construction
• No finger-safe requirements
Bulletin 700-HJ relay see page 94
Will surge suppressors or timing modules be used together with the relay?
No
Yes
No
Yes
Which base style does the relay require?
Bulletin 700-HHF flange-mount relay see page 114
Bulletin 700-HG panel-mount relay see page 111
Blade
Pin
Which contact configuration applies?
Bulletin 700-HB (2PDT, 3PDT) relay see page 75
Bulletin 700-HA (2PDT, 3PDT) relay see page 63
SPDT
2PDT
3PDT
4PDT
Bulletin 700-HK (10 A) relay see page 98 or Bulletin-HL (6 A) relay (2 A) SSR see page 102
Bulletin 700-HF (10 A) relay see page 89 or Bulletin 700-HK (5 A) relay see page 98 or Bulletin 700-HC(10 A) relay see page 85
Bulletin 700-HF (10 A) relay see page 89
Bulletin 700-HC (7 A, 10 A) relay see page 85 or Bulletin 700-HF (10 A) relay see page 89

Low-Energy General Purpose Relay Selection Criteria

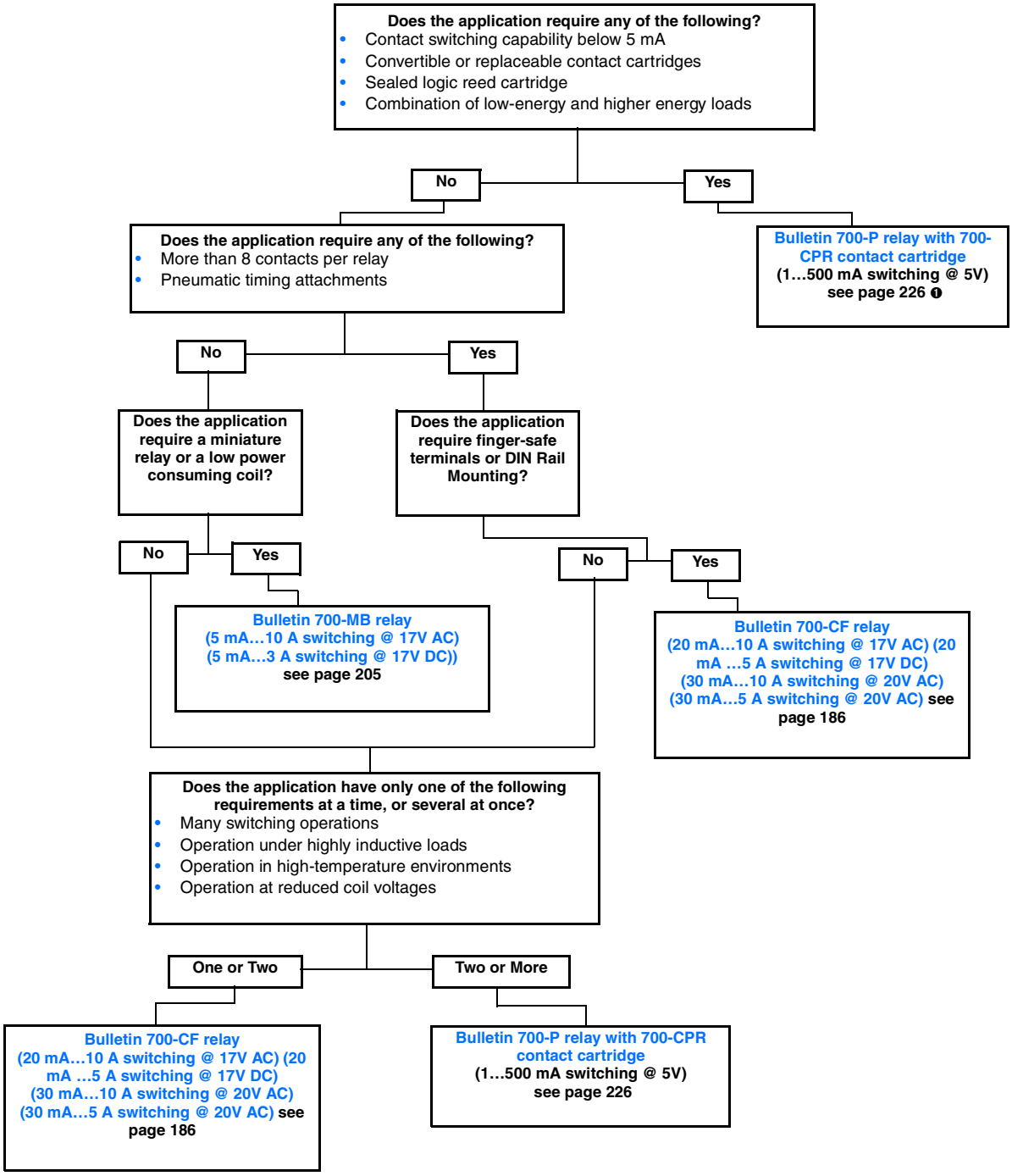

Does the application require contact switching capability below 5 mA?
No
Yes
Does the application require a miniature or slim line relay?
Does the application require a 4PDT contact configuration or a miniature relay?
No
Yes
No
Yes
Bulletin 700-HAB (2PDT, 3PDT) relay (25 mA…3 A switching @ 6V) see page 64
Is the environment relatively free of airborne chemicals that could create a film on the contacts or react with the silver-based contact material?
Bulletin 700-HAX (2PDT or 3PDT) relay (1 mA…3 A switching @ 6V) see page 65 or Bulletin 700-HL _ _X (SPDT) relay (8V, 2.5 mA) see page 102
Bulletin 700-HC14 (4PDT) relay (1 mA…7 A switching @ 10V) see page 85
No
Yes
Bulletin 700-HKX2 (DPDT) relay (10 mA…5 A switching @ 5V) see page 98 or Bulletin 700-HL_ _X (SPDT) relay (8V, 2.5 mA) see page 102 or Bulletin 700-HC14 (4PDT) relay (1 mA...7 A switching @ 10V) see page 85
Bulletin 700-HC24 (4PDT) relay (10 mA…7 A switching @ 10V) see page 85 or Bulletin 700-HL Relay (12V, 6 mA) see page 102 or Bulletin 700-HK32 (DPDT) relay (10 mA…5 A switching @ 5V) see page 98 or Bulletin 700-HC22 (2PDT) relay (10 mA,...7 A switching @ 10V) see page 85

Industrial Relay Selection Criteria


Does the application require any of the following?
• Contact load above 10 A AC or 5 A DC
• Convertible or replaceable contact cartridges?
• Mixture of different contact types to match range of load characteristics
No
Yes
Does the application require either of the following?
• More than 8 contacts per relay
• Pneumatic timing attachments
Which contact load best fits the application?
No
Yes
0…10 A AC
0…5 A DC
10…20 A AC
5…10 A DC
20…35 A AC
10…20 A DC
Does the application require a miniature relay or a low power consuming coil?
Does the application require finger-safe terminals or DIN Rail Mounting?
Bulletin 700-P relay see page 226 ❶
Bulletin 700-PK relay see page 226 ❶
Bulletin 700-PH relay see page 226 ❶
No
Yes
No
Yes
Bulletin 700-M relay (finger-safe terminals, DIN Rail mountable) see page 205
Bulletin 700-CF relay (finger-safe terminals, DIN Rail mountable) see page 186
Does the application have only one of the following requirements at a time, or several at once?
• Many switching operations
• Operation under highly inductive loads
• Operation in high-temperature environments
• Operation at reduced coil voltages
• Mounting in a non-vertical plane
One or Two
Two or More
Bulletin 700-CF relay (finger-safe contacts, DIN Rail mountable) see page 186
Bulletin 700-P relay (Heavy-duty applications, panel mountable) see page 226

❶ Mixture of contact types is permitted.

Low-Energy Industrial Relay Selection Criteria


Does the application require any of the following?
• Contact switching capability below 5 mA
• Convertible or replaceable contact cartridges
• Sealed logic reed cartridge
• Combination of low-energy and higher energy loads
No
Yes
Does the application require any of the following?
• More than 8 contacts per relay
• Pneumatic timing attachments
Bulletin 700-P relay with 700-CPR contact cartridge (1…500 mA switching @ 5V) see page 226 ❶
No
Yes
Does the application require a miniature relay or a low power consuming coil?
Does the application require finger-safe terminals or DIN Rail Mounting?
No
Yes
No
Yes
Bulletin 700-MB relay (5 mA…10 A switching @ 17V AC) (5 mA…3 A switching @ 17V DC)) see page 205
Bulletin 700-CF relay (20 mA…10 A switching @ 17V AC) (20 mA …5 A switching @ 17V DC) (30 mA…10 A switching @ 20V AC) (30 mA…5 A switching @ 20V AC) see page 186
Does the application have only one of the following requirements at a time, or several at once?
• Many switching operations
• Operation under highly inductive loads
• Operation in high-temperature environments
• Operation at reduced coil voltages
One or Two
Two or More
Bulletin 700-CF relay (20 mA…10 A switching @ 17V AC) (20 mA …5 A switching @ 17V DC) (30 mA…10 A switching @ 20V AC) (30 mA…5 A switching @ 20V AC) see page 186
Bulletin 700-P relay with 700-CPR contact cartridge (1…500 mA switching @ 5V) see page 226

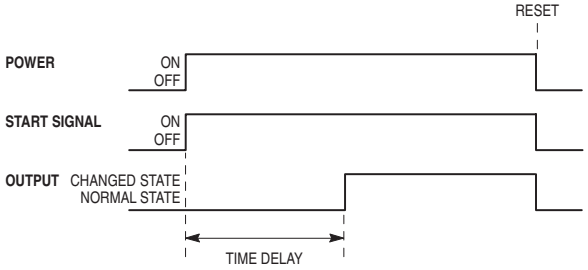
❶ Bulletin 700-CPR cartridge is not direct drive.

Timing Relay Selection Criteria

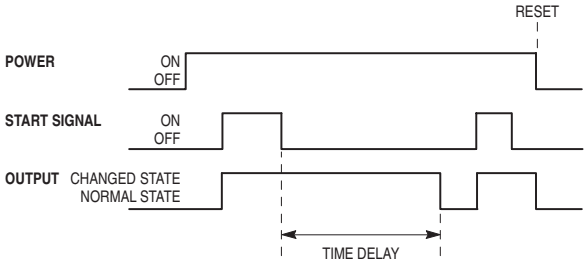
Single Function Timers
Timers that have only 1 timing mode (e.g., ON-Delay or OFF-Delay).

Multi-Function Timers
Timers that have 4…8 timing modes that are selected by turning the mode selection switch.

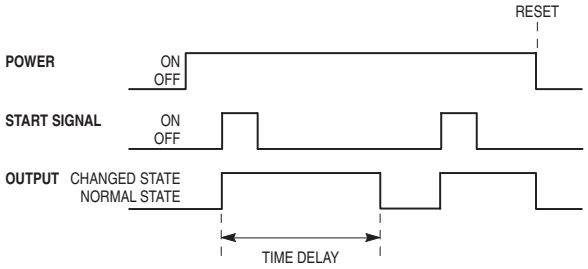
ON-Delay or (Delay on Operate)
When power is applied continuously (or when power and a start signal are applied), the timing cycle begins. The output contacts change state after the time delay is completed. The contacts will return to their normal state when a reset signal is applied or power is removed.



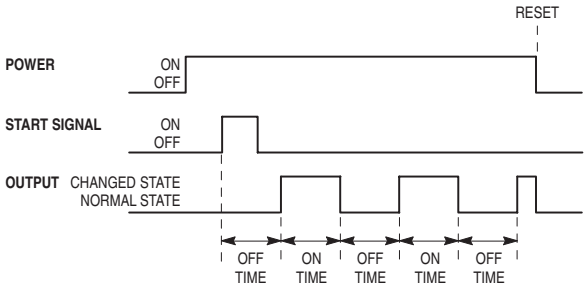
OFF-Delay or (Delay on Release)
Power is applied continuously. When a start signal is applied, the output contacts change state immediately. When the start signal is removed, the timing cycle begins. The output contacts will return to their normal state once the time delay is completed. Reset will occur when a reset signal is applied or power is removed.



One Shot or (Repeat Cycle)
Power is applied continuously. When a start signal is applied, the output contacts change state immediately and the timing cycle begins. The output contacts will return to their normal state once the time delay is completed. Reset will occur when a reset signal is applied or power is removed.



Repeat Cycle or (Flicker)
Power is applied continuously. When a start signal is applied, the timing cycle begins. When the time delay is completed, the output contacts change state and the next timing cycle begins. This cycle will repeat until a reset signal is applied or power is removed.



Flexibility

Mounting — Timing relays are available in several different models. They can be plugged into the same socket as the relay, or use a separate plug-in socket mounting.

Contacts — The contacts are of various types and ratings. Refer to the appropriate specification pages for more details.

Functionality — Timing relays with multi-range and multi-function capability are available. This allows you to stock one relay to cover a wide variety of applications.

External Trigger Switch — OFF-Delay, One-Shot, and other timer functions require an external trigger switch (from a relay or push button) to control the timing function. The external trigger switch will cause the timing function to start. In OFF-Delay, the trigger switch closes to energize the output and when the trigger switch opens the OFF-Delay starts to time out. At the end of the time delay, the output is de-energized and the output contacts return to their shelf state.

Solid-State Relay Glossary

Terms		Meaning
Insulation	Basic insulation	Insulation for basic protection from electric shock (IEC950 1.2.9.2)
	Supplemental insulation	Independent insulation provided outside of basic insulation to protect from electric shock when the basic insulation breaks down (IEC950 1.2.9.3)
	Reinforced insulation	A single-layer of insulation (IEC950 1.2.9.5) that provides the same protection from electric shock as double insulation (insulation including both basic and supplemental insulation) according to conditions stipulated in IEC950 standards
Circuit functions	Zero cross circuit	A circuit that starts operation with the AC load voltage at close to zero-phase.
	Trigger circuit	A circuit for controlling the triac or thyristor trigger signal, which turns the load current ON and OFF.
Input	Isolated input circuit	If the external circuit is prone to generating noise, or if wires from external sources are prone to the influence of inductive noise, in order to prevent malfunctions due to noise, it is necessary to electrically isolate internal circuits and external circuits (output circuits). An isolated input circuit is a circuit that isolates inputs and outputs by using components that are not connected electrically but that can transmit signals, such as contact relays or photocouplers.
	Photocoupler	A component that runs the electric signal into a light emitter (e.g., LED), changes it to a light signal, and then returns it to an electric signal using a photoelectric conversion element, such as a photo transistor. The space used for transferring the light signal is isolated thus providing good insulation and a high propagation speed.
	Rated voltage	The voltage that serves as the standard value of an input signal voltage
	Pickup (must-operate) voltage	Minimum input voltage when the output status changes from OFF to ON.
	Input impedance	The impedance of the input circuit and the resistance of current-limiting resistors used. Impedance varies with the input signal voltage in case of the constant current input method.
	Operating voltage	The permissible voltage range within which the voltage of an input signal voltage may fluctuate.
	Dropout (Reset) voltage	Maximum input voltage when the output status changes from ON to OFF.
	Input current	The current value when the rated voltage is applied.
Output	Load voltage	This is the effective value for the power supply voltage that can be used for load switching or in the continuous-OFF state.
	Maximum load current (continuous)	The effective value of the maximum current that can continuously flow into the output terminals under specified cooling conditions (i.e., the size, materials, thickness of the heat sink, and an ambient temperature radiating condition).
	Leakage current	The effective value of the current that can flow into the output terminals when a specified load voltage is applied to the SSR with the output turned OFF.
	Output ON voltage drop	The effective value of the AC voltage that appears across the output terminals when the maximum load current flows through the SSR under specified cooling conditions (such as the size, material, and thickness of heat sink, ambient temperature radiation conditions, etc.).
	Minimum load current (continuous)	The minimum load current at which the SSR can operate normally.
	Snubber circuit	A circuit consisting of a resistor R and capacitor C, which prevents faulty ignition from occurring in the SSR triac by suppressing a sudden rise in the voltage applied to the triac.
	Semiconductor output element (switching element)	This is a generic name for semiconductors such as the thyristor, triac, power transistor, and power MOS FET. In particular, triacs are often used in SSRs because they allow switching to be performed with one element.
	Repetitive peak OFF-state voltage (VDRM)	This is a rating for an output semiconductor that used in an SSR for AC loads.
	Collector-emitter voltage (VCEO)	This is a rating for an output semiconductor that used in an SSR for DC loads.
Characteristics	Operating (pick-up) time	A time lag between the moment a specified signal voltage is imposed to the input terminals and the output is turned ON.
	Release (drop-out) time	A time lag between the moment the imposed signal input is turned OFF and the output is turned OFF.
	Insulation resistance	The resistance between the input and output terminals or I/O terminals and metal housing (heat sink) when DC voltage is imposed.
	Dielectric strength	The effective AC voltage that the SSR can withstand when it is applied between the input terminals and output terminals or I/O terminals and metal housing (heat sink) for more than 1 minute.
	Ambient temperature and humidity (operating)	The ranges of temperature and humidity in which the SSR can operate normally under specified cooling, input/output voltage, and current conditions.
	Storage temperature	The temperature range in which the SSR can be stored without voltage imposition.
Others	Inrush current resistance	A current which can be applied for short periods of time to the electrical element.
	Counter-electromotive force	Extremely steep voltage rise which occurs when the load switched or turned OFF.
	Recommended applicable load	The recommended load capacity which takes into account the safety factors of ambient temperature and inrush current.
	Bleeder resistance	The resistance connected in parallel to the load in order to increase apparently small load currents, so that the ON/OFF of minute currents functions normally. (It is also used to shunt leakage currents.)

Cat. No.	Page
700-A	86
100-ETA	189
100-FA	188
100-FL	190
100-FS	190
100-FPT	189
100-JE	191
100-SA	188
195-MA	206
196-MT	206
700-CF	186
700-CFZ	187
700-CP	219,220
700-CR	232
700-DCM	205
700DC-P	212
700DC-PH	215
700DC-PK	213
700DC-PL	217
700DC-PPT	216
700-DC-PT	216
700-DC-R	230
700-DC-RM	231
700-FE	117
700-FS	122
700-HA3	63
700-HAB	64
700-HAX	65
700-HB	75
700-HC	85
700-HD	81
700-HF	89
700-HG	111
700-HK3	98
700-HLS	102
700-HLT	102
700-HNC	127
700-HNK	133
700-HP	107
700-HR	139
700-HRC	139
700-HRF	139
700-HRM	139
700-HRY	140
700-HRQ	140
700-HT12	156
700-HT22	156
700-HTF	157
700-HX	165
700-HXM	174
700-M	205
700-MB	205
700-MP	221
700-N23	222
700-N24	222
700-N25	235
700-N26	235
700-N3	222
700-N4	222
700-N5	222
700-P	212
700-PB	219
700-PC	219
700-PH	215
700-PK	213
700-PKT	216
700-PL	217
700-PLL	221
700-PPT	216
700-PS	220,235
700-PT	220
700-R	230
700-RA	232
700-RM	231
700-RTC	238
700-SA	31
700-SC	37
700-SE	42
700-SF	47
700-SH	51
700-SK	58
700S-CF	197
700-TB	103
700Z-P	226

Bulletin 700-SA

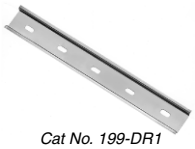
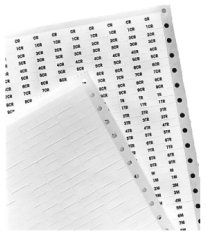
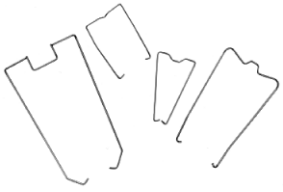
- 5 A (Resistive) Max. Continuous Load Current
- 264V AC or 125V DC Max. Load Voltage Range
- Photocoupler Isolation Between Control and Load Voltage
- LED Indicator for Input/Logic ON/OFF Status Monitoring
- 700-HN100, -HN125, -HN 202, or -HN108 Socket Compatible

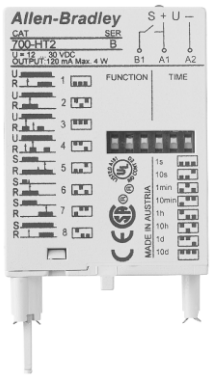
Table Of Contents

Product Selection 31
Accessories 32
Specifications 34
Approximate Dimensions 36

Product Selection

	Input-to-Output Isolation Method	Zero Cross Function	LED Indicator	Rated Output (Load) Max. Current and Voltage Range	Rated Input Control Voltage	Cat. No.	Factory-stocked Item (Single Pack)
	Photocoupler	Yes	Yes	5 A @100…240V AC	5…24V DC	700-SAZY5Z25	✔
		—		3 A @ 5…110V DC		700-SANY3Z25	✔

	Description	Pkg. Quantity	Cat. No.	Factory-stocked Item
Cat. No. 700-HN100	**Screw Terminal Tube Base Socket — Panel or DIN Rail Mounting; Guarded Terminal Construction** Order ten or multiples of ten	10	700-HN100	✔
Cat. No. 700-HN108	**Specialty Socket** 8-pin backwired socket with solder terminals Order ten or multiples of ten	10	700-HN108	✔
Cat. No. 700-HN125	**Screw Terminal Tube Base Socket — Panel or DIN Rail Mounting; Open Style Construction** Order must be for 10 sockets or multiples of 10. No retainer clip required.	10	700-HN125	✔
 *Cat No. 199-DR1*	**DIN Rail Mounting Pack** Standard 35 x 7.5 mm DIN Rail, 1 meter long, 10 rails per package. Order must be for 10 rails or multiples of 10.	10	199-DR1	✔
	**Pre-printed identification tags —** contains 10 sheets of pre-printed and blank tags. Each sheet contains 13 sets of the markings CR…9CR, TR…9TR, M…9M, F, R, 1S, and 117 blank tags. Tags are peel-off with sticky backing for easy placement on relays.	10	700-N40	
	Blank identification tags — contains 10 sheets of blank identification tags for customer specialized printing. Each sheet contains 546 blank tags. Tags are peel-off with sticky backing for easy placement on relays.	10	700-N41	
 *Sample Retainer Clips*	**Retainer Clip for Cat. No. 700-HN153 Sockets with 700-SA Relays** Secures relay in socket. Order must be for 10 clips or multiples of 10.	10	700-HN158	✔
	8-Pin Socket — can be used with or without timing attachment Order ten or multiples of ten	10	700-HN202	✔

	Description	Pkg. Quantity	Cat. No.	Factory-stocked Item
 *Cat. No. 700-HT2*	**Multi-Function Multi-Range Time Module**	1	700-HT2	

Control/Input Ratings					
Cat. No.	Rated Control Voltage	Operating Control Voltage Range	Impedance	Control Voltage Levels	
				Pick-up Voltage	Drop-out Voltage
700-SAZY5Z25	5…24V DC	4…30V DC	1.5 K Ω (+20% -10%)	4V DC max.	1V DC min.
700-SANY3Z25					

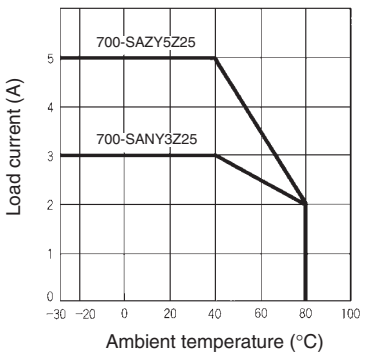
Load/Output Ratings					
Cat. No.	Applicable Load				
	Rated Load Voltage	Load Voltage Range	Continuous Load Current (Resistive)		Max. Inrush Current ❶
			Min.	Max. ❷	
—	—	—			
700-SAZY5Z25	100…240V AC	75…264V AC	0.1 A	5.0 A	80 A, @50/60 Hz for 1 cycle
700-SANY3Z25	5…110V DC	3…125V DC	0.1 A	3.0 A	12 A (10 ms)

Characteristics		
Item	700-SAZY5Z25	700-SANY3Z25
Load Switching Method/Device	Triac	Transistor
Pick-up time	1/2 cycle of load power source + 1 ms max.	0.5 ms max.
Drop-out time	1/2 cycle of load power source + 1 ms max.	2.5 ms max.
Output ON voltage drop	1.6 V (RMS) max.	1.5 V max.
Output Leakage current	5 mA max. (at 100V AC); 10 mA max. (at 200V AC)	5 mA max. (at 125V DC)
Output V_{DRM} V_{CEO} (V)	600	150
Output di/dt (A/uS)	50	—
Output dv/dt (V/uS)	500	—
Output I^2t (A^2S)	41.6	—
Output Tj (°C) Max.	125	150
Insulation resistance	100 MΩ min. (at 500V DC)	
Dielectric strength	1,500V AC, 50/60 Hz for 1 min.	
Vibration resistance (max.)	10…55 Hz, 1.5 mm double amplitude (10 G)	
Shock resistance (max.)	1,000 m/s^2 (100 G)	
Ambient temperature Operating	–30…80°C (–22…176°F) with no icing or condensation	
Ambient temperature Storage	–30…100°C (–22…212°F) with no icing or condensation	
Ambient humidity	45…85% (no condensation)	
Standards	UL508, CSA C22.2 , VDE, CE	
Weight	Approx. 70 g	

❶ If the SSR operation is continuous ON/OFF, this value should be reduced by 50%. Refer to “Inrush Current Resistivity” graphs below.
❷ Refer to the following graph "Load Current Vs. Ambient Temperature Characteristics" for additional load current details.

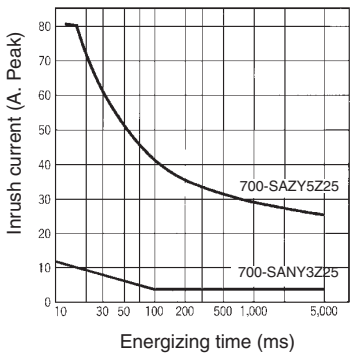
Load Current vs. Ambient Temperature Characteristics

700-SA



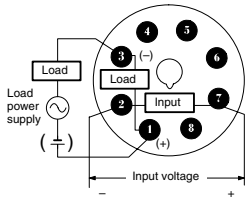
Inrush Current Resistivity ❸

700-SA



❸ Inrush current resistivity is the ability of an SSR to withstand a large surge current for a short period of time. Surges are considered non-repetitive (max. repeatability once every 5 seconds). Keep the inrush current to half the rated value if it occurs repetitively. Exceeding the non-repetitive inrush current will damage the SSR.

Terminal Arrangement (Bottom View)



Note: The plus and minus symbols shown in parentheses are for DC loads.

Basic Application Considerations

High Density Mounting of Multiple SSRs

If multiple SSRs are installed side by side be aware that the outer case wall of the SSR serves to dissipate heat. Install the relays so that they are adequately ventilated. If poor ventilation is unavoidable, reduce the load current to half.

Protective Component

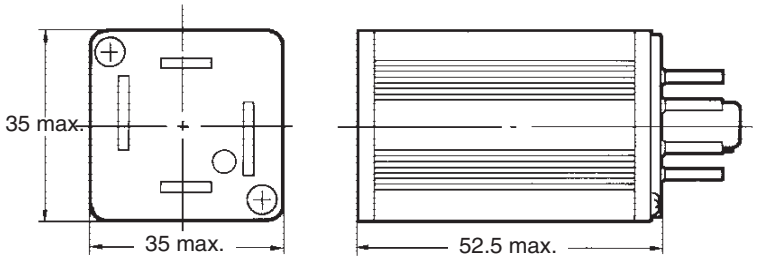
When controlling AC inductive loads, connect an inrush/surge absorbing device (varistor) across the SSR load terminals. If the SSR has built-in surge suppression (Bulletins 700-SE and 700-SH) and additional surge suppression is required, connect the varistor across the terminals of the load device . Select a varistor that meets the conditions of the load voltage outlined in the table below.

Load Voltage	Varistor Voltage	Varistor Surge Resistance
100…120V AC	240…270 V	1000 A min.
200…240V AC	440…470 V	
380…480V AC	820…1000 V	

For additional details applying solid-state relays, refer to pub. 700-AT001A-EN-E, "Solid-State Relay Application Guide" available at www.theautomationbookstore.com.

Note: All units in millimeters unless otherwise indicated. Dimensions are not intended to be used for manufacturing purposes.

700-SA [1]



[1] Bulletin 700-SA is compatible with cat. nos. 700-HN100, -108, -125, and -202 (sockets).

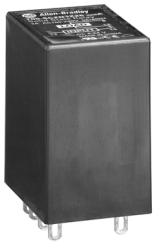
Bulletin 700-SC

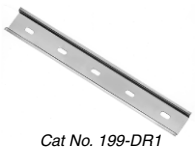
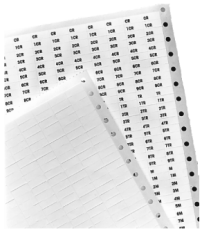
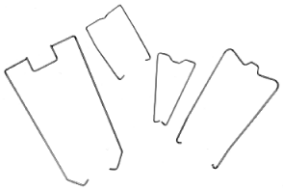
- 3 A (resistive) Max. Continuous Load (Output) Current
- 264V AC, 48V DC or 125V DC Max. Load Voltage Range Options
- 5…24V DC or 110/220V AC Control (Input) Voltage Options
- LED Indicator (Optional) For Input/Logic ON/OFF Status Monitoring
- 700-HN103, 700-HN104, or 700-HN128 Socket Compatible
- Compatible with 700-AT1 or 700-AT2 Timer Module

Table Of Contents

Product Selection 37
Accessories 38
Specifications 39
Approximate Dimensions 41

Product Selection

	Input-to-Output Isolation Method	Zero Cross Function	LED Indicator	Rated Output (Load) Max. Current and Voltage Range	Rated Input Control Voltage	Cat. No.	Factory-stocked Item (Single Pack)
	Photocoupler	Yes	Yes	3 A @100…240V AC	5…24V DC	700-SCZY3Z25	✔
				2 A @ 100…240V AC	100/110V AC	700-SCZY2A1	✔
					200/220V AC	700-SCZY2A2	✔
	Phototriac	No		3 A @100…240V AC	24V DC	700-SCTY3Z24	✔
	Photocoupler	No		3 A @ 4…48V DC	5…24V DC	700-SCNY3Z25	✔
		Yes	No	3 A @ 100…240V AC	4…24V DC	700-SCZN3Z26	✔
	Phototriac	No			24V DC	700-SCTN3Z24	✔
	Photocoupler	N/A		3 A @ 4…48V DC	4…24V DC	700-SCNN3Z26	✔
				2 A @ 5…110V DC	5…24V DC	700-SCNN2Z25	✔

	Description	Pkg. Quantity	Cat. No.	Factory-stocked Item
Cat. No. 700-HN103	**Screw Terminal Socket — Panel or DIN Rail Mounting; Guarded Terminal Construction** Order must be in ten or multiples of ten	1	700-HN103	✔
Cat. No. 700-HN104	**Screw Terminal Socket – Panel or DIN Rail Mounting. Guarded Terminal Construction** 14-blade miniature socket for use with Bulletin 700-SC relays. This socket has coil and contact separation as well as the ability to plug in optional plug in modules (700-A** accessories: LED, Surge Suppression, Timing Modules)	10	700-HN104	✔
Cat. No. 700-HN128	**Screw Terminal Base Socket — Panel or DIN Rail Mounting; Open Style Construction** Order must be in multiples of ten	10	700-HN128	✔
 *Cat No. 199-DR1*	**DIN Rail Mounting Pack** Standard 35 x 7.5 mm DIN Rail, 1 meter long, 10 rails per package. Order must be for 10 rails or multiples of 10.	10	199-DR1	✔
	**Pre-printed identification tags —** contains 10 sheets of pre-printed and blank tags. Each sheet contains 13 sets of the markings CR…9CR, TR…9TR, M…9M, F, R, 1S, and 117 blank tags. Tags are peel-off with sticky backing for easy placement on relays.	10	700-N40	
	Blank identification tags — contains 10 sheets of blank identification tags for customer specialized printing. Each sheet contains 546 blank tags. Tags are peel-off with sticky backing for easy placement on relays.	10	700-N41	
 *Sample Retainer Clips*	**Retainer Clip** **Secures relay in socket. Order must be for 10 clips or multiples of 10.**	10	700-HN114(B)❶	✔
	ON-Delay Time Module Voltage Range: 12…24V AC/DC used with 700-HN153 socket	1	700-AT1	
	One Shot Timing Module Voltage Range: 12…24V AC/DC used with 700-HN153 socket	1	700-AT2	

❶ Series B retainer clip must be used with Bulletin 700-SC

Control/Input Ratings					
Cat. No.	Rated Control Voltage	Operating Control Voltage Range	Impedance	Control Voltage Levels	
				Pick-up Voltage	Drop-out Voltage
700-SCZY3Z25	5…24V DC	4…28V DC	15 mA max. ❶	4V DC max.	1V DC min.
700-SCZY2A1	100/110V AC	75…125V AC	41 KΩ± 20%	75V AC max.	20V AC min.
700-SCZY2A2	200/220V AC	150…250V AC	72 KΩ ± 20%	150V AC max.	40V AC min.
700-SCTY3Z24	24V DC	19.2…28.8V DC	2 KΩ ± 20%	19.2V DC max.	1V DC min.
700-SCNY3Z25	5…24V DC	4…28V DC	1.5 KΩ + 20%/–10% ❷	4V DC max.	
700-SCZN3Z26	4…24V DC	3…28V DC	15 mA max. ❶	3V DC max.	
700-SCTN3Z24	24V DC	19.2…28.8V DC	2 kΩ ± 20%	19.2V DC max.	
700-SCNN3Z26	4…24V DC	3…28V DC	1.5 KΩ + 20%/–10% ❷	3V DC max.	
700-SCNN2Z25	5…24V DC				

Load/Output Ratings					
Cat. No.	Rated Load Voltage	Applicable Load			
		Load Voltage Range	Continuous Load Current (Resistive)		Max. Inrush Current ❸
			Min.	Max. ❹	
—	—	—	—	—	—
700-SCZY3Z25	100…240V AC	75…264V AC	0.1 A	3 A	45 A (@50/60 Hz, 1 cycle)
700-SCTY3Z24					
700-SCZN3Z26					
700-SCTN3Z24					
700-SCZY2A1	100…240V AC		0.1 A	2 A	
700-SCZY2A2					
700-SCNN3Z25	4…48V DC	3…52.8V DC	0.1 A	3 A	18 A (10 ms)
700-SCNY3Z26					
700-SCNN2Z25	5…110V DC	3…125V DC	0.1 A	2 A	10 A (10 ms)

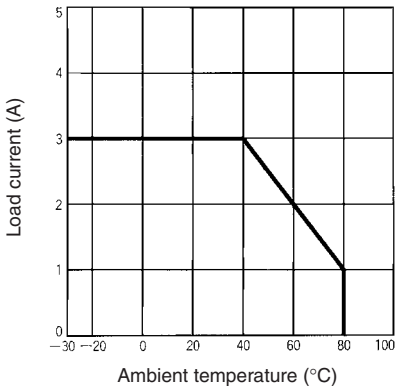
❶ With constant current input circuit system. SSR impedance varies with a change in input voltage.
❷ Input impedance attains its maximum at the operating voltage.
❸ If the SSR operation is continuous ON/OFF, this value should be reduced by 50%. Refer to “Inrush Current Resistivity” graphs on page 40 for details.
❹ Refer to the following "Load Current Versus Ambient Temperature Characteristics" graphs on page 40 for additional load current details.

Characteristics				
Cat. No.	700-SCZ….	700-SCT	700-SCNN3…	700-SCNN2…
Load Switching Method/Device	Triac		Transistor	
Pick-up Time	1/2 of load power source + 1 ms max. (DC input)	1 ms max	0.5 ms max	0.5 ms max
	3/2 of load power source + 1 ms max. (AC input)			
Drop-out Time	1/2 of load power source + 1 ms max. (DC input)	1/2 of load power source + 1 ms max	2 ms max	2.5 ms max
	3/2 of load power source + 1 ms max. (AC input)			
Output ON Voltage Drop	1.6 V (RMS) max	1.6V (RMS)	1.5 V max.	1.5V max.
Output Leakage Current	5 mA max (@ 100 V AC) 10 mA max (@ 200 V AC)	2.5 mA max (@ 100 V AC) 5 mA max (at 200 V AC)	5 mA max (@ 50 V DC)	0.1 mA max (@ 100 V DC)
Output V_{DRM}, V_{CEO} (V)	600	600	80	80
Output di/dt (A/uS)	50	50	—	—
Output dv/dt (V/uS)	250	250	—	—
Output I^2t (A^2S)	18	18	—	—
Output Tj °C Max.	125	125	150	150
Insulation Resistance	100 MΩ min (@ 500V DC)			
Dielectric Strength	1,500 V AC, 50/60 Hz for 1 minute			
Vibration Resistance (max.)	10…55 Hz, 1.5 mm double amplitude (10 G)			
Shock Resistance (max.)	1,000 m/s^2 (100 G)			
Ambient Temperature	Operating: -30°C…80°C (-22...176°F) with no icing or condensation Storage: -30°C…100°C (-22...212°F) with no icing or condensation			

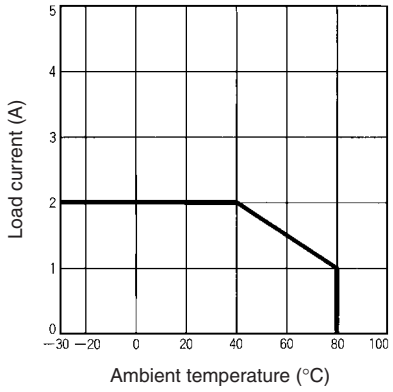
Characteristics	
Standards	UL508, CSA C 22.2, CE, VDE
Ambient Humidity	Operating: 45%…85% (no condensation)
Weight	Approx. 50 g

Load Current Versus Ambient Temperature Characteristics

700-SC_ _3...

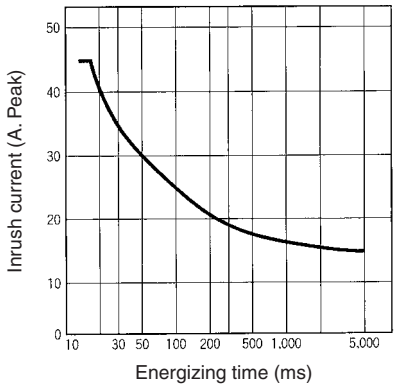


700-SC_ _2...

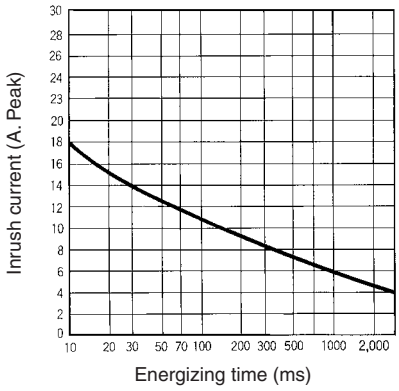


Inrush Current Resistivity❶

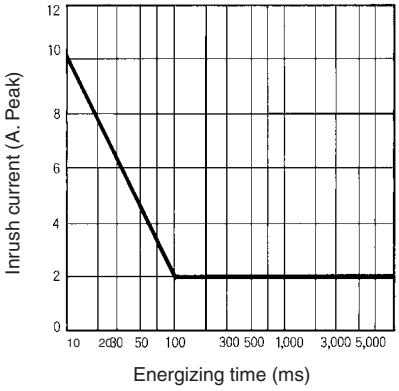
700-SCZ.... 700-SCT...



700-SCNN3... 700-SCNY3

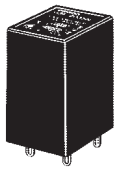


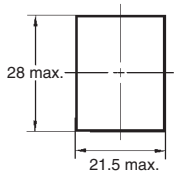
700-SCNN2...

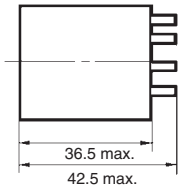


❶ Inrush current resistivity is the ability of an SSR to withstand a large surge current for a short period of time. Surges are considered non-repetitive (max. repeatability once every 2…5 seconds). Keep the inrush current to half the rated value if it occurs repetitively. Exceeding the non-repetitive inrush current will damage the SSR.

Note: Bulletin 700-SC is compatible with the 700-HN103, 700-HN104, and 700-HN128 sockets. All units in millimeters unless otherwise indicated. Dimensions are not intended for manufacturing purposes.

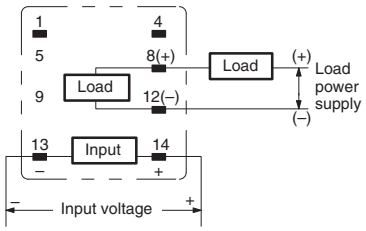






Cat, No 700-SC… ❶

Terminal Arrangement/ Internal Connections (Bottom View)



Note: The plus and minus symbols shown in parentheses are for DC loads.

❶ Bulletin 700-SC is compatible with cat. nos. 700-HN103, -HN104, and -HN128 socket.

Basic Application Considerations For Bulletin 700-SC

Connection

For DC Load Switching, Bulletin 700-SC will operate properly if the load is connected to either the positive or negative SSR load terminal.

High-density Mounting of Multiple SSRs

If multiple relays are mounted side by side, be aware that the outer wall of each SSR works as a radiator.
The SSR casing serves to dissipate heat. Install the relays so that they are adequately ventilated. If poor ventilation is unavoidable, reduce the load current by half.

Protective Component

When controlling AC inductive loads, connect an inrush/surge absorbing device (varistor) across the SSR load terminals. If the SSR has built-in surge suppression (Bulletins 700-SE and 700-SH) and additional surge suppression is required, connect the varistor across the terminals of the load device . Select a varistor that meets the conditions of the load voltage outlined in the table below. Note: For additional details applying solid-state relays, refer to pub. number 700-AT001A-EN-E, "Solid-State Relay Application Guide." Document available at www.theautomationbookstore.com.

Load Voltage	Varistor Voltage	Varistor Surge Resistance
100…120V AC	240…270 V	1000 A min.
200…240V AC	440…470 V	
380…480V AC	820…1000 V	

Bulletin 700-SE

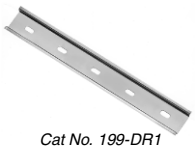
- 20 A (resistive) Max. Continuous Load (Output) Current with Heat Sink
- 264V AC Max. Load Voltage Range
- 5,12, or 24V DC Control/Input Voltage
- Built-in Varistor Helps Absorb Most Electrical Surges
- Low Profile (Flat Pack) Design
- Quick-Connect #110 Input and #250 Output Terminals

Table Of Contents

Product Selection 42
Accessories 43
Specifications 44
Approximate Dimensions 46

	Input-to-Output Isolation Method	Zero Cross Function	LED Indicator	Rated Output (Load) Max. Current and Voltage Range ❶	Rated Input Control Voltage	Cat. No.	Factory-stocked Item (single pack)
	Phototriac	Yes	No	5 A at 100…240V AC	5V DC	700-SE05GZZ05	✔
					12V DC	700-SE05GZZ12	✔
					24V DC	700-SE05GZZ24	✔
				10 A at 100…240V AC	5V DC	700-SE10GZZ05	✔
					12V DC	700-SE10GZZ12	✔
					24V DC	700-SE10GZZ24	✔
				20 A at 100…240V AC	5V DC	700-SE20GZZ05	✔
					12V DC	700-SE20GZZ12	✔
					24V DC	700-SE20GZZ24	✔
		No		5 A at 100…240V AC	5V DC	700-SE05GNZ05	✔
					12V DC	700-SE05GNZ12	✔
					24V DC	700-SE05GNZ24	✔
				10 A at 100…240V AC	5V DC	700-SE10GNZ05	✔
					12V DC	700-SE10GNZ12	✔
					24V DC	700-SE10GNZ24	✔
				20 A at 100…240V AC	5V DC	700-SE20GNZ05	✔
					12V DC	700-SE20GNZ12	✔
					24V DC	700-SE20GNZ24	✔

❶ Maximum load current when mounted on a heat sink.

	Description	Pkg. Quantity	Cat. No.	Factory-stocked Item
Cat No. 700-S10	**Heat Sink — Panel or DIN Rail Mount ❶**	1	700-S10	✔
Cat No. 700-S20	**Heat Sink — Panel or DIN Rail Mount ❶**	1	700-S20	✔
 *Cat No. 199-DR1*	**DIN Rail Mounting Pack** Standard 35 x 7.5 mm DIN Rail, 1 meter long, 10 rails per package. Order must be for 10 rails or multiples of 10.	10	199-DR1	✔

❶ Refer to "Load Current Vs. Ambient Temperature Characteristics" page 45 for information about how to select the correct size of heat sink for your application (cat. no. 700-S10, 700-S20).

Control/Input Ratings ❶						
Cat. No.	Rated Control Voltage	Operating Control Voltage Range	Input Impedance		Control Voltage Levels	
			With Zero Cross Function	Without Zero Cross Function	Pick-up Voltage	Drop-out Voltage
700-SE_ _ _Z05	5V DC	4…6V DC	250 Ω ± 20%	300 Ω ± 20%	4V DC max.	1V DC min.
700-SE_ _ _Z12	12V DC	9.6…14.4V DC	600 Ω ± 20%	800 Ω ± 20%	9.6V DC max.	
700-SE_ _ _Z24	24V DC	19.2…28.8V DC	1.6k Ω ± 20%		19.2V DC max.	

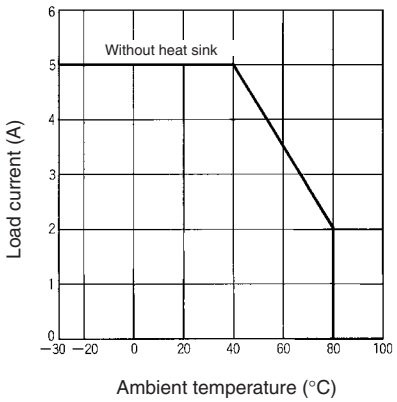
Load/Output Ratings							
Cat. No.	Applicable Load						
	Rated Load Voltage	Load Voltage Range	Continuous Load Current (Resistive)				Max. Inrush Current ❸
			With Heat Sink ❷		Without Heat Sink ❷		
			Min.	Max.	Min.	Max.	
700-SE05…	100…240V AC	75…264V AC	0.1 A	5 A	0.1 A	5 A	60 A (@50/60 Hz, 1 cycle)
700-SE10…			0.1 A	10 A	0.1 A	5 A	150 A (@50/60 Hz, 1 cycle)
700-SE20…			0.1 A	20 A	0.1 A	5 A	220 A (@50/60 Hz, 1 cycle)

Characteristics			
Item		700-SE_ _ _Z…	700-SE_ _ _N…
Load Switching Method/Device		Triac	
Pick-up time		1/2 of load power source cycle + 1 ms max.	1 ms max.
Drop-out time		1/2 of load power source cycle + 1 ms max.	
Output ON voltage drop		1.6 V (RMS) max.	
Output Leakage current		5 mA max. (at 100V AC) 10 mA max. (at 200V AC)	
Output V_{DRM} V_{CEO} (V)		600	600
Output di/dt (A/uS)		SE05GZ=100 SE10GZ & SE20 GZ =50	SE05GN=100 SE10 GN & SE20GN =50
Output dv/dt (V/uS)		SE05GZ=200, SE10GZ=500, SE20GZ=100	SE05GN =200, SE10GN =500, SE20GN =100
Output I^2t (A^2S)		SE05GZ =24.5, SE10GZ =60, SE20GZ =260	SE05GN =24.5, SE10GN =60, SE20GN =260
Output Tj (°C) max.		125	125
Insulation resistance		100 MΩ min. (at 500V DC)	
Dielectric strength		2,000V AC, 50/60 Hz for 1 min.	
Vibration resistance (max.)		10…55 Hz, 1.5 mm double amplitude (10 G)	
Shock resistance (max.)		1,000 m/s² (100 G)	
Ambient temperature		Operating: –30…80°C (–22…176°F) with no icing or condensation Storage: –30…100°C (–22…212°F) with no icing or condensation	
Ambient humidity	Operating	45…85% (no condensation)	
Standards		UL 508, CSA C22.2 , TUV, CE	
Weight		Approx. 37 g	

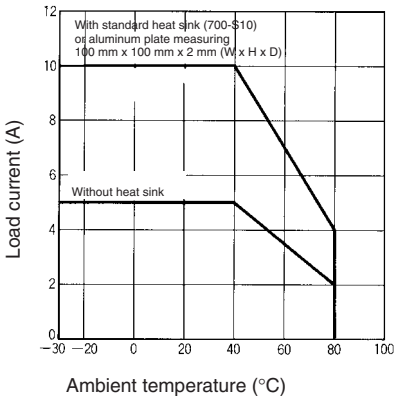
❶ Each 5 A, 10 A, and 20 A model has 5V DC, 12V DC, and 24V DC input versions.
❷ Refer to "Load Current Vs. Ambient Temperature Characteristics" graphs page 45 regarding maximum load current with and without heat sinks.
❸ If the SSR operation is continuous ON/OFF, this value should be reduced by 50%. Refer to the “Inrush Current Resistivity” graphs on page 45 for more details.

Load Current vs. Ambient Temperature Characteristics

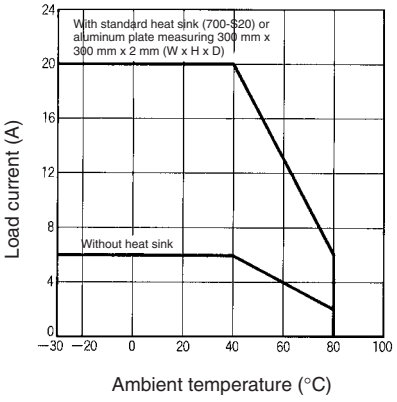
700-SE05…



700-SE10…

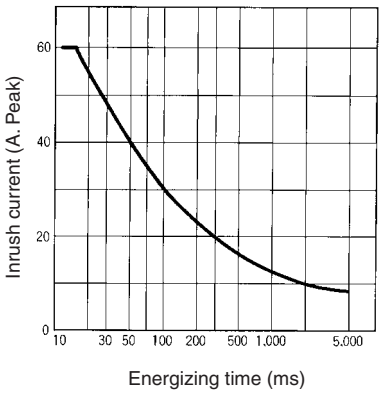

With standard heat sink (700-S10) or aluminum plate measuring 100 mm x 100 mm x 2 mm (W x H x D)
Without heat sink
Load current (A)
Ambient temperature (°C)

700-SE20…

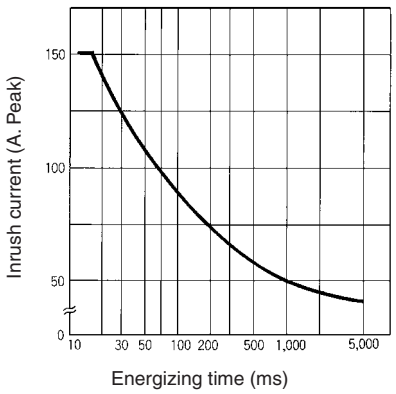

With standard heat sink (700-S20) or aluminum plate measuring 300 mm x 300 mm x 2 mm (W x H x D)
Without heat sink
Load current (A)
Ambient temperature (°C)

Inrush Current Resistivity❶

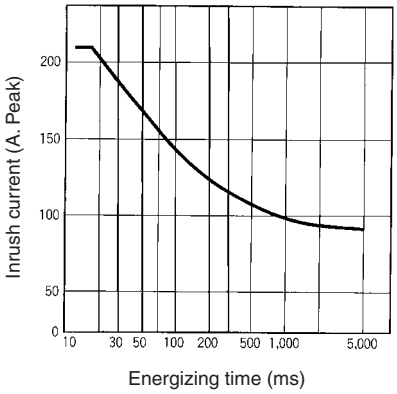
700-SE05...



700-SE10...



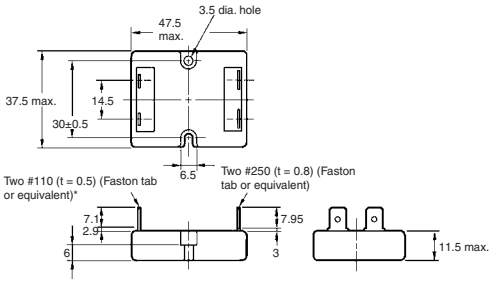
700-SE20...



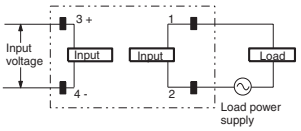
❶ Inrush current resistivity is the ability of an SSR to withstand a large surge current for a short period of time. Surges are considered non-repetitive (max. repeatability once every 2…5 seconds). Keep the inrush current to half the rated value if it occurs repetitively. Exceeding the non-repetitive inrush current will damage the SSR.

Mounting Considerations❶❷❸

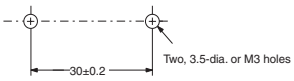
Note: All units are in millimeters unless otherwise indicated. Dimensions are not intended for manufacturing purposes.



Terminal Arrangement/ Internal Connections (Top View)



Mounting Holes

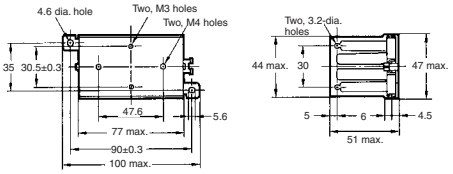


❶ The proper mounting orientation of the heat sink is so the heat fins run perpendicular to the floor (vertical) to maximize ventilation flow. If the fins do not run perpendicular to the floor, a 30% current derating is required.
❷ When attaching a heat sink to Bulletin 700-SE, apply heat conductive grease on the heat sink to maximize heat transfer between the SSR and the heat sink. Recommended types: Silicon based, Toshiba YG6240; Non-silicon based, AOS company type 53300.
❸ Tighten the SSR's panel/heat sink mounting screws to a torque of 0.78…0.98 Nm (6.9…8.7 lb.-in.)

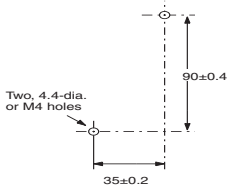
Heat Sinks

Cat. No. 700-S10

Weight: Approx. 200 g

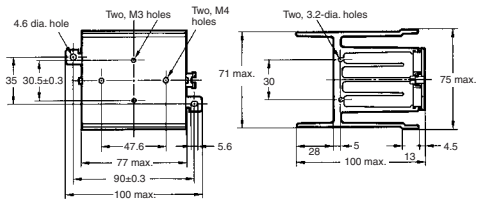


Mounting Holes ❹

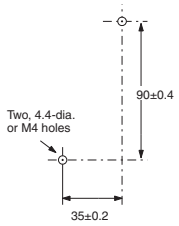


Cat. No. 700-S20

Weight: Approx. 400 g

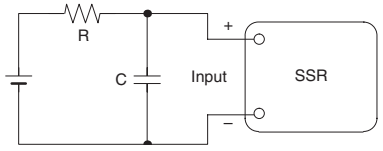


Mounting Holes



❹ Tighten the heat sink's panel mounting screws (M4) to a torque of 0.59…0.98 Nm (5.22…8.67 lb.-in.).

Basic Application Considerations



- Because the operation time of Bulletin 700-SE is extremely short, take measures to suppress noise induced between the **input** terminals. If generation of strong noise is expected, connect an external noise absorber such as an RC circuit.
- Do not apply excessive force to the terminals. Exercise care when pulling or inserting the terminal clips.
- Bulletin 700-SE has a built-in varistor to absorb most inrush/surge currents when operating AC inductive loads If additional suppression is required, connect an external varistor across the load device terminals. Select a varistor that meets the load voltage outlined in the table below.
- For additional details on applying solid-state relays, refer to pub. 700-AT001A-EN-P, "Solid-State Relay Application Guide." Document available at www.theautomationbookstore.com.

Load Voltage	Varistor Voltage	Varistor Surge Resistance
100…120V AC	240…270 V	1000 A min.
200…240V AC	440…470 V	
380…480V AC	820…1000 V	

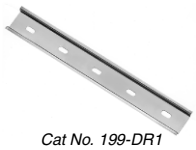
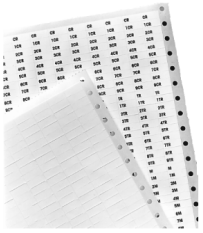
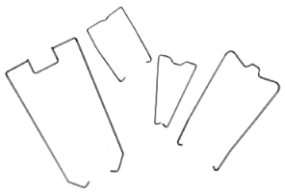
Bulletin 700-SF

- 3 A (resistive) Max. Continuous Load (Output) Current
- 264V AC or 52.8V DC Max. Load Voltage Range
- 4…24V DC Control/Input Voltage
- Photocoupler or Phototriac Isolation Option Between Control and Output Voltage
- LED Indicator for Input/Logic ON/OFF Status Monitoring
- 700-HN116 Socket Compatible

Table Of Contents

Product Selection 47
Accessories 48
Specifications 49
Approximate Dimensions 50

	Input-to-Output Isolation Method	Zero Cross Function	LED Indicator	Rated Output (Load) Max. Current and Voltage Range	Rated Input Control Voltage	Cat. No.	Factory-stocked Item (Single Pack)
	Photocoupler	Yes	Yes	3 A at 100…240V AC	5…24V DC	700-SFZY3Z25	✔
	Phototriac	No			24V DC	700-SFTY3Z24	✔
	Photocoupler	N/A		3 A at 4…48V DC	4…24V DC	700-SFNY3Z25	✔

	Description	Pkg. Qty.	Cat. No.	Factory-stocked Item
Cat. No 700-HN116	**Screw Terminal Socket — Panel or DIN Rail Mounting** 8-blade miniature socket for use with DPDT HF relays. Order must be for 10 sockets or multiples of 10.	10	700-HN116	✔
 *Cat No. 199-DR1*	**DIN Rail Mounting Pack** Standard 35 x 7.5 mm DIN Rail, 1 meter long, 10 rails per package. Order must be for 10 rails or multiples of 10.	10	199-DR1	✔
	**Pre-printed identification tags —** contains 10 sheets of pre-printed and blank tags. Each sheet contains 13 sets of the markings CR…9CR, TR…9TR, M…9M, F, R, 1S, and 117 blank tags. Tags are peel-off with sticky backing for easy placement on relays.	10	700-N40	✔
	Blank identification tags — contains 10 sheets of blank identification tags for customer specialized printing. Each sheet contains 546 blank tags. Tags are peel-off with sticky backing for easy placement on relays.	10	700-N41	✔
 *Sample Retainer Clips*	**Retainer Clip for Cat. No. 700-HN103 and -HN128 Sockets with 700-SF Relays and Cat. No. 700-HN116 Sockets** Secures relay in socket. Order must be for 10 clips or multiples of 10.	10	700-HN114B❶	✔

❶ Bulletin 700-SF must use 700-HN114 series B retainer clip.

Control/Input Ratings					
Cat. No.	Rated Control Voltage	Operating Control Voltage Range	Impedance	Control Voltage Levels	
				Pick-up Voltage	Drop-out Voltage
700-SFZY3Z25	5…24V DC	4…28V DC	15 mA max. ❶	4V DC max.	1V DC min.
700-SFTY3Z24	24V DC	19.2…28.8V DC	2 kΩ ± 20%	19.2V DC max.	1V DC min.
700-SFNY3Z25	5…24V DC	4…28V DC	1.5 kΩ + 20%/–10% ❷	4V DC max.	1V DC min.

Load/Output Ratings					
Cat. No.	Applicable Load				
	Rated Load Voltage	Load Voltage Range	Continuous Load Current (Resistive)		Max. Inrush Current ❸
—	—	—	Min.	Max.❹	—
700-SFZY3Z25	100…240V AC	75…264V AC	0.1 A	3 A	45 A @50/60 Hz, 1 cycle
700-SFTY3Z24			0.1 A	3 A	
700-SFNY3Z25	4…48V DC	3…52.8V DC	0.1 A	3 A	18 A (10 ms)

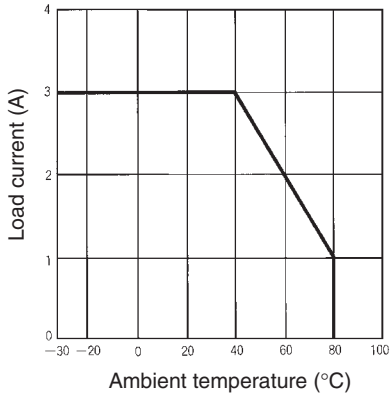
Characteristics			
Cat. No.	700-SFZY3Z25	700-SFTY32...	700-SFNY3Z25
Load Switching Method/Device	Triac	Transistor	
Pick-up time	1/2 cycle of load power source + 1 ms max.	1 ms max.	0.5 ms max.
Drop-out time	1/2 of output switching element cycle of load power source + 1 ms max.		2 ms max.
Output ON voltage drop	1.6V (RMS) max.		1.5V max.
Output Leakage current	5 mA max. (at 100V AC); 10 mA max. (at 200V AC)	2.5 mA max. (at 100V AC); 5 mA max. (at 200V AC)	5 mA max. (at 50V DC)
Output V_{DRM} V_{CEO} (V)	600	600	80
Output di/dt (A/uS)	50	50	—
Output dv/dt (V/uS)	250	250	—
Output I^2t (A^2S)	18	18	—
Output Tj (°C) (max.)	125	125	150
Insulation resistance	100 MΩ min. (at 500V DC)		
Dielectric strength	1,500V AC, 50/60 Hz for 1 min.		
Vibration resistance (max.)	10…55 Hz, 1.5 mm double amplitude (10 G)		
Shock resistance (max.)	1,000 m/s^2 (100 G)		
Ambient temperature	Operating: –30…80°C (–22…176°F) with no icing or condensation Storage: –30…100°C (–22…212°F) with no icing or condensation		
Ambient humidity	45…85% (no condensation)		
Standards	UL508, CSA C22.2, CE		
Weight	Approx. 50 g		

❶ With constant current input circuit system, SSR impedance varies with a change in input voltage.
❷ Input impedance reaches its maximum at the operating voltage.
❸ If the SSR operation is continuous ON/OFF, this value should be reduced by 50%. Refer to the “Inrush Current Resistivity” graphs on page 50 for more details.
❹ Refer to "Load Current vs. Ambient Temperature Characteristics" on page 50 for additional load current details.

Note: These data are non-repetitive. Keep the inrush current to half the rated value if it occurs repetitively. Inrush current resistivity is the ability of an SSR to withstand a large surge current for a short period of time. Surges are considered non-repetitive (max. repeatability once every 2…5 seconds). Keep the inrush current to half the rated value if it occurs repetitively. Exceeding the non-repetitive inrush current will damage the SSR.

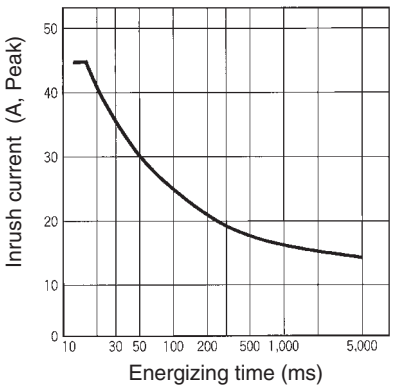
Load Current vs. Ambient Temperature Characteristics

700-SF



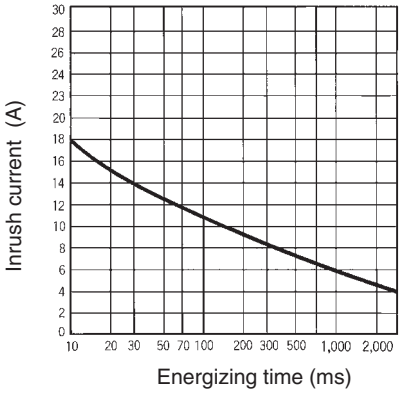
Inrush Current Resistivity ❶

700-SFZ… 700-SFT…



Inrush Current Resistivity ❶

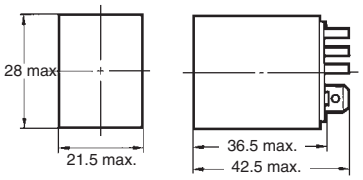
700-SFN…



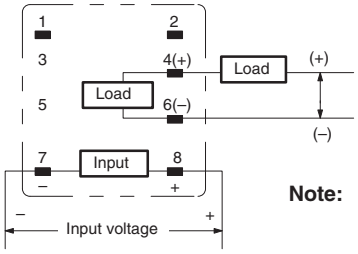
❶ Inrush current resistivity is the ability of an SSR to withstand a large surge current for a short period of time. Surges are considered non-repetitive (max. repeatability once every 2…5 seconds). Keep the inrush current to half the rated value if it occurs repetitively. Exceeding the non-repetitive inrush current will damage the SSR.

Approximate Dimensions

All units are in millimeters unless otherwise indicated. Dimensions are not intended for manufacturing purposes.



Terminal Arrangement/ Internal Connections (Bottom View)



Note:
1. The plus and minus symbols shown in the parentheses are for DC loads.
2. The coil has no polarity.

Note: The 700-SF is compatible with the 700-HN116 socket.

Basic Application Considerations of Bulletin 700-SF

High Density Mounting of Multiple SSRs

If multiple SSRs are mounted side by side be aware that the outer case wall of the SSR acts as a radiator. The SSR case serves to dissipate heat. Install the relays so that they are adequately ventilated. If poor ventilation is unavoidable, reduce the load current by half.

Connection

For DC load switching, the 700-SF SSR will operate properly if the load is connected to either the positive or negative load terminals.

Protective Component To Extend SSR Life

When controlling AC inductive loads, connect an inrush/surge absorbing device (varistor) across the SSR load terminals. If the SSR has built-in surge suppression (Bulletins 700-SE and 700-SH) and additional surge suppression is required, connect the varistor across the terminals of the load device . Select a varistor that meets the conditions of the load voltage outlined in the table below.

Load Voltage	Varistor Voltage	Varistor Surge Resistance
100…120V AC	240…270 V	1000 A min.
200…240V AC	440…470 V	
380…480V AC	820…1000 V	

Note: For additional details applying solid-state relays, refer to pub. number 700-AT001A-EN-E, Solid-State Relay Application Guide. Document available at http://www.theautomationbookstore.com.

Bulletin 700-SH

- 40 A (resistive) Max. Continuous Load (Output) Current with Heat Sink
- 264V AC or 528V AC Max. Load Voltage Range Options
- 5…24V DC, 100…120V AC, 200…240V AC Control Input Voltage
- LED Indicator for Input/Logic ON/OFF Status Monitoring
- Built-in Varistor to Absorb Most Surges
- Protective Cover for Added Safety (Meets VDE 106 Finger Safe Standard)

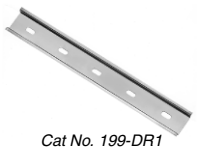
Table Of Contents

Product Selection 51
Accessories 52
Specifications 53
Approximate Dimensions 56
Basic Application Considerations 57

Product Selection

	Input-to-Output Isolation Method	Zero Cross Function	LED Indicator	Rated Output (Load) Max. Current and Voltage Range ❶	Rated Input Control Voltage	Cat. No.	Factory-Stocked Item (Single Pack)
	Phototriac	Yes	Yes	5 A @ 24…240V AC	5…24V DC	700-SH05GZ25	✔
	Photocoupler				100…120V AC	700-SH05GA12	✔
					200…240V AC	700-SH05GA22	✔
	Phototriac			10 A @ 24…240V AC	5…24V DC	700-SH10GZ25	✔
	Photocoupler				100…120V AC	700-SH10GA12	✔
					200…240V AC	700-SH10GA22	✔
				10 A @ 200…480V AC	5…24V DC	700-SH10HZ25	✔
	Phototriac			25 A @ 24…240V AC	5…24V DC	700-SH25GZ25	✔
	Photocoupler				100…120V AC	700-SH25GA12	✔
					200…240V AC	700-SH25GA22	✔
	Photocoupler			25 A @ 200…480V AC	5…24V DC	700-SH25HZ25	✔
	Phototriac			40 A @ 24…240V AC	5…24V DC	700-SH40GZ25	✔
	Photocoupler				100…120V AC	700-SH40GA12	✔
					200…240V AC	700-SH40GA22	✔
				40 A @ 200…480V AC	5…24V DC	700-SH40HZ25	✔

❶ Maximum load current when mounted on a heat sink

	Description	Pkg. Qty	Cat. No.	Factory-Stocked Item
Cat No. 700-S10	**Heat Sink— Panel or DIN Rail Mount ❶**	1	700-S10	✔
Cat No. 700-S20	**Heat Sink— Panel or DIN Rail Mount ❶**	1	700-S20	✔
Cat No. 700-S30	**Heat Sink— Panel or DIN Rail Mount ❶**	1	700-S30	✔
 *Cat No. 199-DR1*	**DIN Rail Mounting Pack** Standard 35 x 7.5 mm DIN Rail, 1 meter long, 10 rails per package. Order must be for 10 rails or multiples of 10.	10	199-DR1	✔

❶ For information regarding selection of the proper heat sink for your application, refer to "Heat Sink Size Vs. Load Current" graph on page 54 or "Load Current Vs. Ambient Temperature Characteristics" on page 55.

Control/Input Ratings					
Cat. No.	Rated Control Voltage	Operating Control Voltage Range	Impedance ❶	Control Voltage Levels	
				Pick-up Voltage	Drop-out Voltage
700-SH_ _G…	5...24V DC	4...32V DC	15 mA max ❷	4V DC max.	1V DC min.
	100...120V AC	75...132V AC	36 kΩ +/-20%	75V AC max. ❸	20V AC min. ❸
	200...240V AC	150…264V AC	72 kΩ +/-20%	150V AC max. ❸	40V AC min. ❸
700-SH_ _ H…	5...24V DC	4…32V DC	5 mA max. ❷	4V DC max.	1V DC min.

Load/Output Ratings							
Cat. No.	Applicable Load						
	Rated Load Voltage	Load Voltage Range	Continuous Load		Current (Resistive)		Max. Inrush Current❺
			With Heat Sink (A) ❹		Without Heat Sink (A) ❹		
	—	—	Min.	Max.	Min.	Max.	
700-SH05G…	24…240V AC	19 …264V AC	0.1 A	5 A	0.1 A	3 A	60 A (@50/60 Hz, 1 cycle)
700-SH10G…			0.1 A	10 A	0.1 A	4 A	150 A (@50/60 Hz, 1 cycle)
700-SH10H…	200…480V AC	180…528 VAC	0.2 A	10 A	0.2 A	4 A	
700-SH25G…	24…240V AC	19…264V AC	0.1 A	25 A	0.1 A	4 A	220 A (@ 50/60 Hz, 1 cycle)
700-SH25H…	200…480V AC	180…528V AC	0.2 A	25 A	0.2 A	4 A	
700-SH40G…	24…240V AC	19…264V AC	0.1 A	40 A	0.1 A	6 A	440 A (@ 50/60 Hz, 1 cycle)
700-SH40H…	200…480V AC	180…528V AC	0.2 A	40 A	0.2 A	6 A	

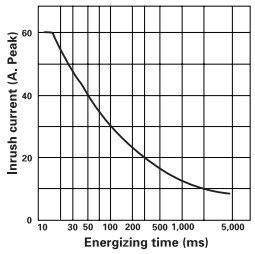
❶ The input impedance is measured at the maximum value of the rated supply voltage.
❷ With a constant current input system, SSR impedance varies with a change in input voltage.
❸ Refer to graphs, “Temperature Characteristics…” and “Must Release Voltage” on page 54 for further details.
❹ When specified heat sink is used. Refer to accessories, page 52 for applicable heat sinks. For more details, refer to graphs “Load Current Vs. Ambient Temperature Characteristics” on page 55, and the “Heat Sink vs. Load Current” graph on page 54.
❺ If the SSR operation is continuous ON/OFF, this value should be reduced by 50%. Refer to “Inrush Current Resistivity” graphs on page 54 for more details.

Characteristics			
Cat. No.	**700-SH05G, -SH10G, SH25G**	**700-SH40G**	**700-SH10H, -SH25H, SH40H**
Load Switching Method/ Device	Triac		Thyristor
Pick-up Time	1/2 of load power source + 1 ms max. (DC input) 3/2 of load power source + 1 ms max. (AC input)		
Drop-out Time	1/2 of load power source + 1 ms max. (DC input) 3/2 of load power source + 1 ms max. (AC input)		
Output ON Voltage Drop	1.6 V (RMS) max		1.8 V (RMS) max
Output Leakage Current	5 mA max (at 100V AC)		10 mA max. (@ 200V AC)
	10 mA max (at 200V AC)		20 mA max. (@ 400V AC)
Output V_{DRM}, V_{CEO} (V)	600	600	1200
Output di/dt (A/uS)	-SHO5G = 100, -SHO10G, -SH25G= 50	50	100
Output dv/dt (V/uS)	-SHO5G = 200, -SHO10G, -SH25G= 100	100	300
Output I^2t (A^2S)	-SHO5G = 24.5, -SHO10G=112.5 -SH25G= 260	1260	260, SH40 = 1800
Output Tj °C Max.	125		
Insulation Resistance	100 MΩ min (at 500 VDC)		
Dielectric Strength	2,500V AC, 50/60 Hz for 1 minute		
Vibration Resistance (max.)	10…55 Hz, 1.5 mm double amplitude (10 G)		
Shock Resistance (max.)	1,000 m/s^2 (100 G)		
Ambient Temperature	Operating: -30°C…80°C (-22°F…176°F) with no icing or condensation		
	Storage: -30°C…100°C (-22°F…212°F) with no icing or condensation		
Ambient Humidity	Operating: 45%…85% (no condensation)		
Standards ❶	UL508, CSA C22.2, CE, TÜV		
Weight	Approx. 60g	Approx. 70g	Approx. 80g

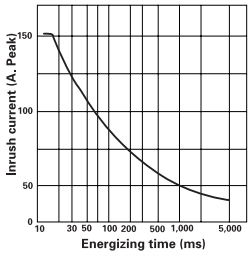
❶ Cat. No. 700-SH_ _ _HZ25 not CE or TÜV approved.

Inrush Current Resistivity❷

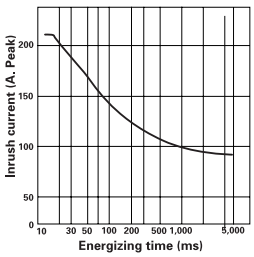
700-SH05G...



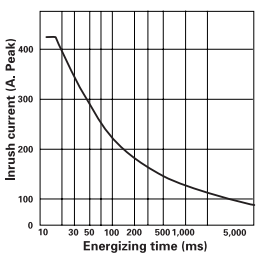
700-SH10G... SH10H...



700-SH25G... SH25H...

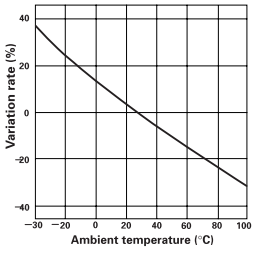


700-SH40G... SH40H...



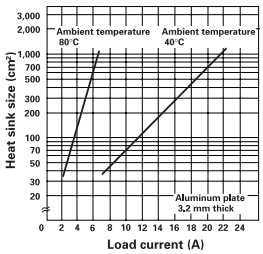
Temperature Characteristics (with Must Operate Voltage and Must Release Voltage)

700-SH_ _G...



Heat Sink Size vs. Load Current

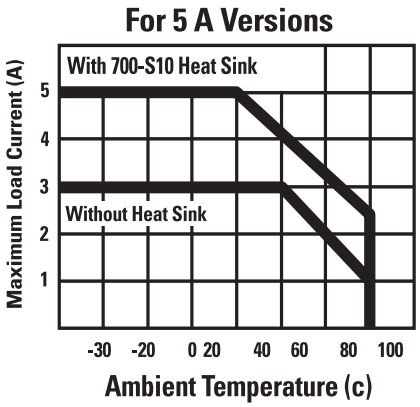
700-SH 25G... ❸

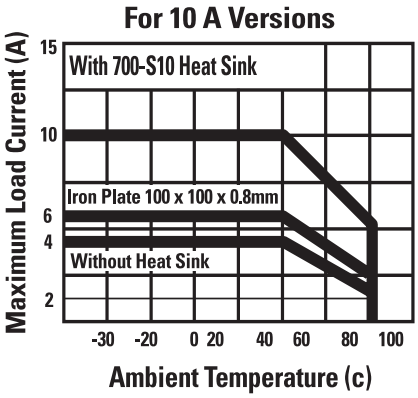


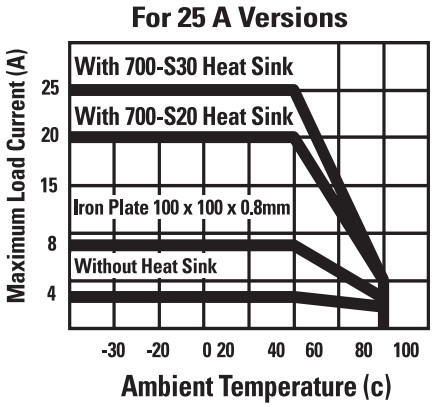
❷ Inrush current resistivity is the ability of an SSR to withstand a large surge current for a short period of time. Surges are considered non-repetitive (max. repeatability once every 2…5 seconds). Keep the inrush current to half the rated value if it occurs repetitively. Exceeding the non-repetitive inrush current will damage the SSR.

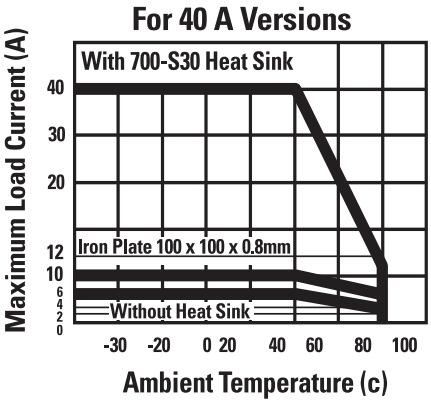
❸ The heat sink size refers to the combined area of the sides of the heat sink that radiate heat. For example, when a current of 18 A is allowed to flow through the SSR at 40°C, the graph shows that the heat sink size is about 450 cm^2. Therefore, if the heat sink is square, one side of the heat sink must be 15 cm (15^2 x 2 = 450) or longer.

Load Current vs. Ambient Temperature Characteristics❶❷





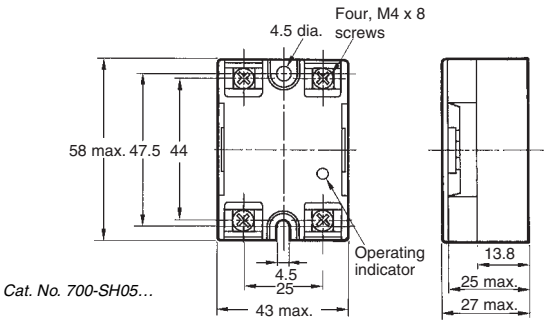




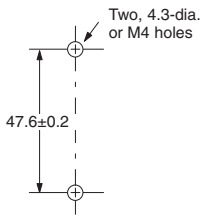
❶ For the above 5 graphs, the line “with iron plate measuring 100 x 100 x 0.8” means the SSR is mounted directly to an iron plate of at least this size.
❷ All graphs assume conductive grease is being used. Refer to page 56 for details of using conductive grease.

Mounting Considerations❶❷❸❹❺

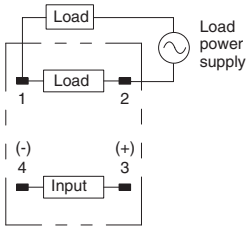
All units are in millimeters unless otherwise indicated. Dimensions are not intended for manufacturing purposes.

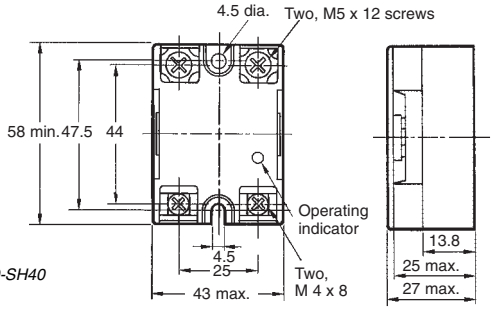


Mounting Holes

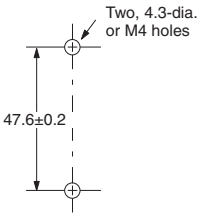


Terminal Arrangement/ Internal Connections (Top View)



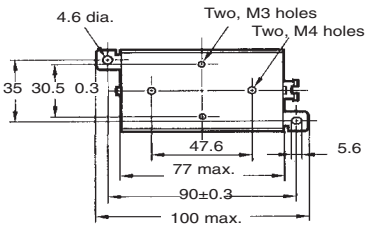


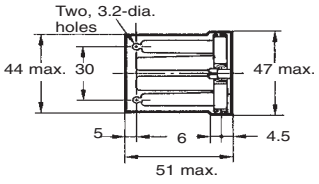
Mounting Holes



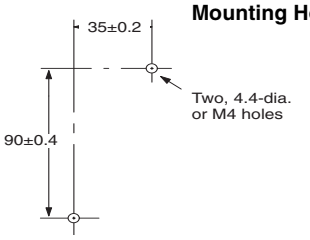
❶ The proper mounting orientation of the heat sink is so the heat fins run perpendicular to the floor (vertical) to maximize ventilation flow.
❷ If the fins do not run perpendicular to the floor, a 30% current derating is required.
❸ When attaching a heat sink to Bulletin 700-SH, apply heat conductive grease on the heat sink to maximize heat transfer between the SSR and the heat sink. Recommended types: Silicon based, Toshiba YG6240; Non-silicon based, AOS company type 53300.
❹ Tighten the SSR panel/heat sink mounting screws to a torque of 0.78…0.98 Nm (6.9…8.7 lb-in).
❺ Tighten the SSR terminal wiring screws as follows M4: 0.98…1.37 Nm (8.67…12.12 lb-in.), M5: 1.57…2.35 Nm (13.89…20.8 lb-in.)

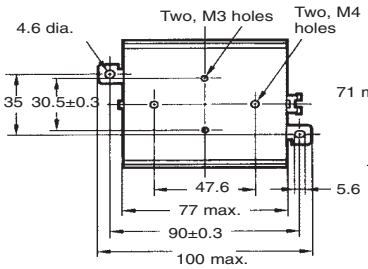
Heat Sinks❻ ❼

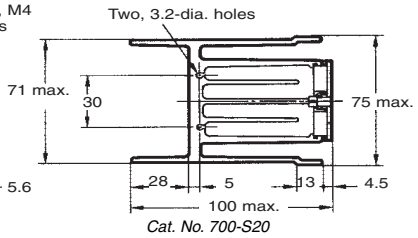




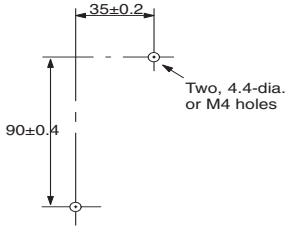
Mounting Holes

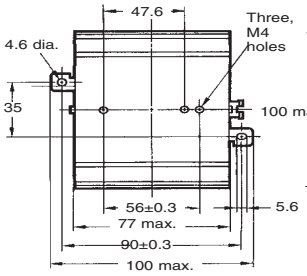


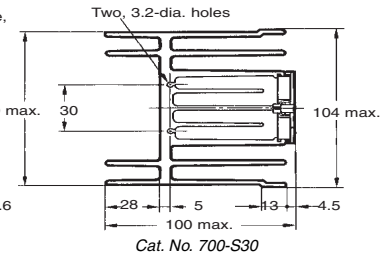




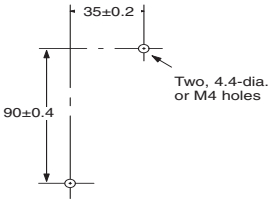
Mounting Holes







Mounting Holes



❻ Tighten the heat sink mounting screws (M4) to a torque of 0.98…1.37 Nm (8.67…12.12 lb-in).
❼ Heat sink weight: cat. nos. 700-S10 = 200 g, 700-S20 = 400 g, 700-S30 = 560 g

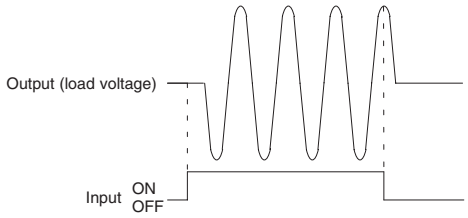
Load Connection

- **For an AC load, use a power supply rated at 50 or 60 Hz. The maximum operating frequency is 10 Hz.**
- **The Bulletin 700-SH has a built-in varistor for surge/inrush protection of AC loads. If additional suppression is required, connect an external varistor across the load device terminals. Select a varistor which meets the load voltage condition outlined in the table below.**

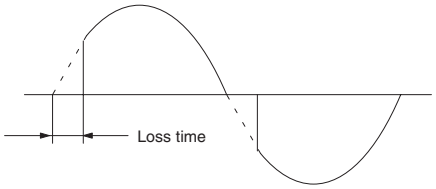
Load Voltage	Varistor Voltage	Varistor Surge Resistance
100…120V AC	240…270 V	1000 A min.
200…240V AC	440…470V	
380…480V AC	820…1000V	

Zero Cross Function

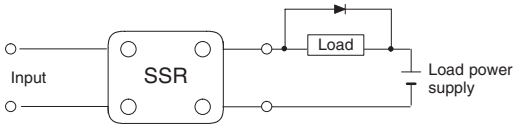
A SSR with a zero cross function operates when an AC load voltage reaches the zero point or its vicinity. This reduces clicking noises when the load is switched, and minimizes the influence of an inductive load, such as a lamp, heater, or motor, on the power supply because the inrush current of the load is reduced. This can also minimize the scale of the inrush current protection circuit.



At a low applied voltage, such as 24V AC, the load current is not fully supplied. When the unit is switched ON, the voltage required to power the unit deprives the output signal of the necessary voltage level and thus creates loss time. The lower the load voltage is, the greater the loss time is. This condition, however, will not create any serious problems.



For a DC inductive load, a diode should be connected parallel to the load to absorb the counter electromotive force (OFF) of the load.



Note: For additional details when using Solid-State Relays, refer to pub. 700-AT001A--EN-E, “Solid-State Relay Application Guide" available at www.theautomationbookstore.com.

Bulletin 700-SK

- High Response Speed Models
- Input Sensor Module to Allow High Voltage 100…240V AC or 12…24V DC Sensor Interface to Low Voltage (Logic) Device Such as a PC
- Output Module For Typical SSR Applications
- LED Indicator
- Input Modules and Output Modules Can Be Used With the 700-HN121 Socket

Table Of Contents

Product Selection 58
Accessories 58
Specifications 60
Approximate Dimensions 62

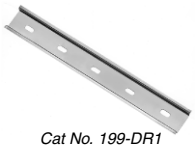
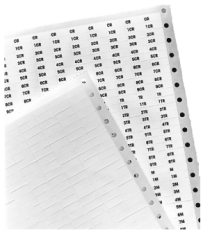
Product Selection

Input/Sensor Module

Input-to-Output Isolation Method	LED Indicator	Response Speed	Logic Level		Rated Input Sensor Voltage	Cat. No.	Factory-stocked item (Single Pack)
			Supply Voltage	Supply Current			
Photocoupler	Yes	10 Hz	4…32V DC	0.1…100 mA	100…240V AC	700-SKICA18	✔
		High-speed (1 kHz)			12…24V DC	700-SKICZ24	✔

Output/SSR Module

Input-to-Output Isolation Method	Zero Cross Function	LED Indicator	Rated Output (Load) Max. Current and Voltage Range	Rated Input Control Voltage	Cat. No.	Factory-stocked item (Single Pack)
Phototriac	Yes	Yes	2 A at 100…240V AC	5…24V DC	700-SKOZ2Z25	✔
	No				700-SKON2Z25	✔
Photocoupler	N/A		2 A at 5…48V DC		700-SKOC2Z25	✔
			1.5 A at 48…200V DC		700-SKOC1Z25	✔

	Description	Pcs./Pkg.	Cat. No.	Factory-stocked Item
Cat No. 700-HN121	**Screw Terminal Socket — Panel or DIN Rail Mounting** Order must be in multiples of ten	10	700-HN121	✔
 *Cat No. 199-DR1*	**DIN Rail Mounting Pack** Standard 35 x 7.5 mm DIN Rail, 1 meter long, 10 rails per package. Order must be for 10 rails or multiples of 10.	10	199-DR1	✔
	**Pre-printed identification tags —** contains 10 sheets of pre-printed and blank tags. Each sheet contains 13 sets of the markings CR…9CR, TR…9TR, M…9M, F, R, 1S, and 117 blank tags. Tags are peel-off with sticky backing for easy placement on relays.	10	700-N40	
	Blank identification tags — contains 10 sheets of blank identification tags for customer specialized printing. Each sheet contains 546 blank tags. Tags are peel-off with sticky backing for easy placement on relays.	10	700-N41	

Input Sensor Module

Input Sensor Ratings					
Cat, No.	**Rated Input Voltage**	**Operating Voltage Range**	**Input Current**	**Pick-up Voltage**	**Drop-out Voltage**
700-SKICZ24	12…24V DC	6.6…32V DC	8 mA max.	6.6V DC max.	3.6V DC min.
700-SKICA18	100…240V AC	60…264V AC	15 mA max.	60V AC max.	20V AC min.

Output Logic Ratings		
Cat. No.	**Logic Level Supply Voltage**	**Logic Level Supply Current Draw**
700-SKICZ24 700-SKICA18	4…32V DC	0.1…100 mA

Characteristics			
Cat. No.		**700-SKICA18**	**700-SKICZ24**
Pick-up time		20 ms max.	0.1 ms max.
Drop-out time		20 ms max.	0.1 ms max.
Response frequency		10 Hz	1 kHz
Output ON voltage drop		1.6 V max.	
Leakage current		5 µA max.	
V_{DRM} V_{CEO} (V)		80 (ref. value)	80 (ref. value)
Output di/dt (A/uS)		—	—
Output dv/dt (V/uS)		—	—
Output I^2t (A^2S)		—	—
Output Tj (°C) Max.		150	150
Insulation resistance		100 MΩ min. between input and output	
Dielectric strength		4,000V AC, 50/60 Hz for 1 min. between input and output	
Vibration resistance (max.)		10…55 Hz, 1.5 mm double amplitude (10 G)	
Shock resistance (max.)		1,000 m/s² (100 G)	
Ambient temperature	Operating Storage	–30…80°C (–22…176°F) with no icing or condensation –30…100°C (–22…212°F) with no icing or condensation	
Standards		UL 508 CSA C22.2 CE, TÜV	
Ambient humidity	Operating	45…85% (No condensation)	
Weight		Approx. 18 g	

Output SSR Module

Control/Input Ratings					
Cat. No.	**Rated Control Voltage**	**Operating Control Voltage Range**	**Impedance❶**	**Pick-up Voltage**	**Drop-out Voltage**
700-SKOZ2Z25	5…24V DC	4…32V DC	15 mA max. at 25°C (77°F)	4V DC max.	1V DC min.
700-SKON2Z25					
700-SKOC2Z25			8 mA max.		
700-SKOC1Z25					

Load/Output Ratings					
Cat. No.	**Rated Load Voltage**	**Load Voltage Range**	**Continuous Load Current (Resistive)**		**Max. Inrush Current❷**
—	—	—	**Min.**	**Max.❸**	—
700-SKOZ2Z25	100…240V AC	75…264V AC	0.05 A	2 A	30 A (@50/60 Hz, 1 cycle)
700-SKON2Z25					
700-SKOC2Z25	5…48V DC	4…60V DC	0.01 A	2 A	8 A (10 ms)
700-SKOC1Z25	48…200V DC	40…200V DC	0.01 A	1.5 A	8 A (10 ms)

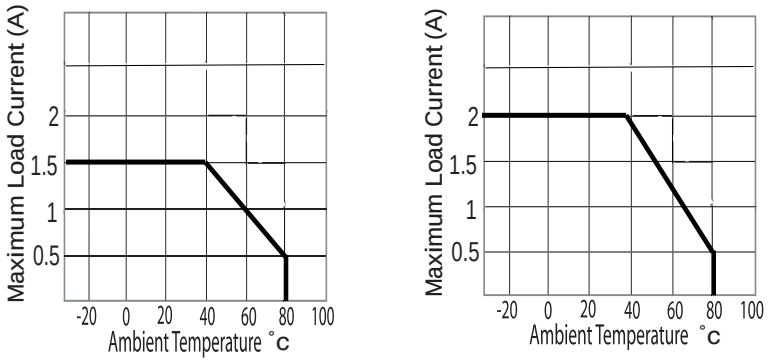
❶ With a constant current input system. SSR impedance varies with a change in input voltage.
❷ If the SSR operation is continuous ON/OFF, this value should be reduced by 50%. Refer to the “Inrush Current Resistivity” graphs on page 61 for more details.
❸ Refer to "Load Current Versus Ambient Temperature Characteristics" graphs on page 61 for additional details.

Output Module, Continued

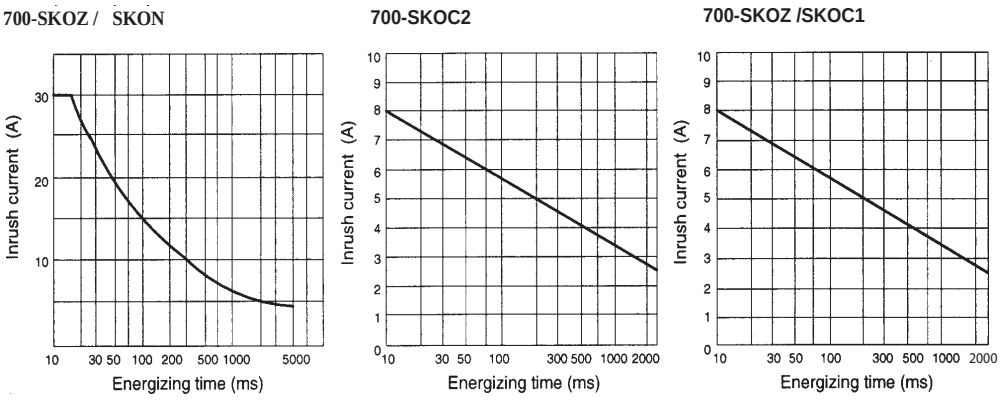
Characteristics				
Cat. No.	700-SKOZ2Z25	700-SKON2Z25	700-SKOC2Z25	700-SKOC1Z25
Load Switching Method/Device	Triac		Transistor	
Pick-up time	1/2 of load power source cycle + 1 ms max.		1 ms max.	
Drop-out time	1/2 of load power source cycle + 1 ms max.		2 ms max.	
Response frequency	20 Hz		100 kHz	
Output ON voltage drop	1.6 V max.			2.5V max.
Leakage current	1.5 mA max.		1 mA max.	
V_{DRM} V_{CEO} (V)	600 (ref.value)	600 (ref.value)	80 (ref.value)	400 (ref.value)
Output di/dt (A/uS)	30	30	—	—
Output dv/dt (V/uS)	300	300	—	—
Output I^2t (A^2S)	10.4	10.4	—	—
Output Tj (°C) Max.	125	125	150	150
Insulation resistance	100 MΩ min. between input and output			
Dielectric strength	4,000V AC, 50/60 Hz for 1 min. between input and output			
Vibration resistance (max.)	10…55 Hz, 1.5 mm double amplitude (10 G)			
Shock resistance (max.)	1,000 m/s² (100 G)			
Ambient temperature Operating Storage	–30…80°C (–22…176°F) with no icing or condensation –30…100°C (–22…212°F) with no icing or condensation			
Standards	UL 508 CSA C22.2, CE TÜV			
Ambient humidity Operating	45…85% (no condensation)			
Weight	Approx. 18 g			

Load Current vs. Ambient Temperature Characteristics

For 2 A Versions



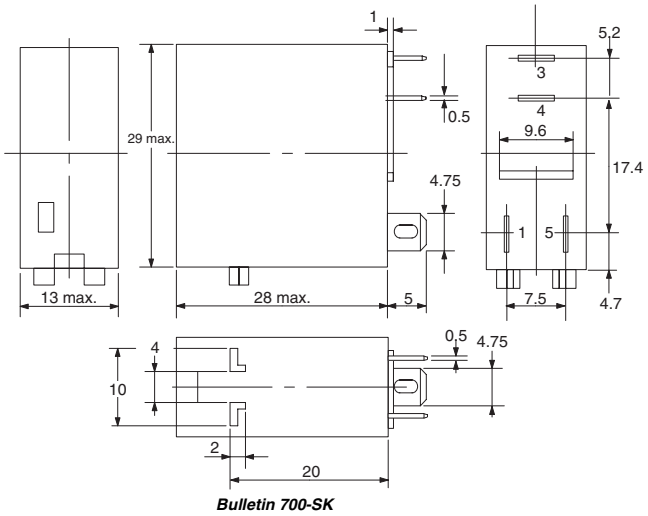
Inrush Current Resistivity❶



❶ Inrush current resistivity is the ability of an SSR to withstand a large surge current for a short period of time. Surges are considered non-repetitive (max. repeatability once every 2…5 seconds). Keep the inrush current to half the rated value if it occurs repetitively. Exceeding the non-repetitive inrush current will damage the SSR.

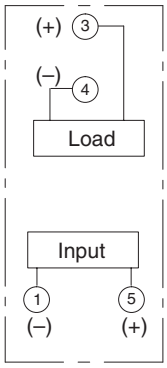
Approximate Dimensions

All units are in millimeters unless otherwise indicated. Dimensions are not to be used for manufacturing purposes.
Note: The input module (700-SKI) and output module (700-SKO) are compatible with the 700-HN121 socket.



Bulletin 700-SK

Terminal Arrangement/ Internal Connections (Bottom View)



Application Considerations of Bulletin 700-SK

Connection

For DC load switching, Bulletin 700-SK SSR will operate properly if the load is connected to either the positive or negative SSR load terminal. The load can be connected to either positive or negative output terminals of the SSR.

Protective Element (to extend SSR life)

Since the SSR does not incorporate a surge absorption component, be sure to connect a surge absorption component when using the SSR to control an inductive load.

For additional details applying solid-state relays, refer to pub. number 700-AT001A-EN-E, "Solid-State Relay Application Guide." Document available at www.theautomationbookstore.com.

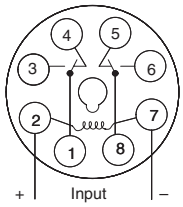
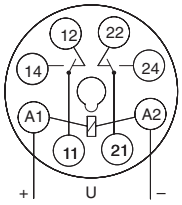
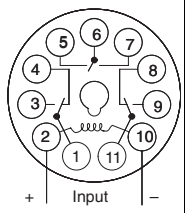
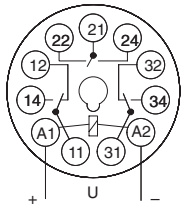
Bulletin 700-HA

- 10 A Contact Rating
- DPDT, 3PDT
- Pin Style Terminals
- Standard ON/OFF Flag Indicator
- Options: LED, Push-to-Test and Manual Override, Socket Mounted Surge Suppressor Module, or Multifunction Timer
- Contact Choices: Standard Silver Nickel, Bifurcated Silver Nickel, or Bifurcated with Gold Plating

Table Of Contents

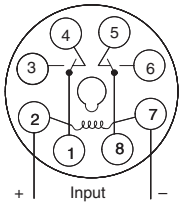
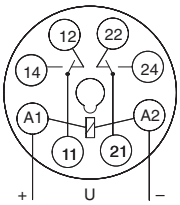
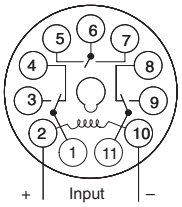
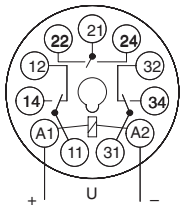
Product Selection 63
Accessories 66
Specifications 69
Approximate Dimensions 72

Bulletin 700-HA Tube Base Relay with PIN Terminals (Single Contact) — Mechanical ON/OFF Indicator included ❶

Description	Contact Rating	Wiring Diagrams		Coil Voltage	Cat. No. ❷❸❹	Factory-Stocked Item	
		U.S./Canada	International			❼	❽
DPDT 2-Pole 2 Form C Single AgNi Contact	10 A B300	 *700-HN125*	 *700-HN100* *700-HN202*	6V AC	700-HA32A06		
				12V AC	700-HA32A12	✔	
				24V AC	700-HA32A24 ❺	✔	
				120V AC	700-HA32A1 ❺	✔	✔
				240V AC	700-HA32A2 ❺	✔	
				277V AC	700-HA32A27❻	✔	
				6V DC	700-HA32Z06		
				12V DC	700-HA32Z12 ❺	✔	
				24V DC	700-HA32Z24 ❺	✔	
				36V DC	700-HA32Z36		
				48V DC	700-HA32Z48	✔	
				60V DC	700-HA32Z60		
				80V DC	700-HA32Z80		
				110V DC	700-HA32Z1	✔	
				125V DC	700-HA32Z01	✔	
Sockets				140V DC	700-HA32Z3		
				220V DC	700-HA32Z2		
3PDT 3-Pole 3 Form C Single AgNi Contact	10 A B300	 *700-HN126*	 *700-HN101* *700-HN203*	6V AC	700-HA33A06		
				12V AC	700-HA33A12		
				24V AC	700-HA33A24 ❺	✔	
				120V AC	700-HA33A1 ❺	✔	✔
				240V AC	700-HA33A2	✔	
				6V DC	700-HA33Z06		
				12V DC	700-HA33Z12	✔	
				24V DC	700-HA33Z24 ❺	✔	
				48V DC	700-HA33Z48		
				60V DC	700-HA33Z60		
				80V DC	700-HA33Z80		
				110V DC	700-HA33Z1		
				125V DC	700-HA33Z01	✔	
Sockets				140V DC	700-HA33Z3		
				220V DC	700-HA33Z2		

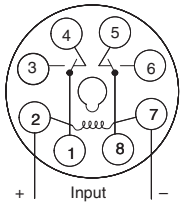
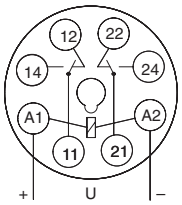
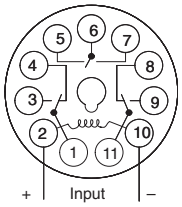
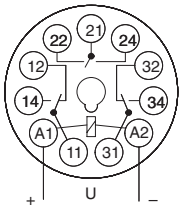
❶ For Time Module and Surge Suppressor Module, see page 47.
❷ LED Option: Add suffix **(-4)** to the selected Bulletin 700-HA Relay Cat. No., except for the 240V AC Units, add (**-4L**).
❸ Push-to-test, Manual Override, and LED Option: Add suffix **(-3-4)** to the selected Bulletin 700-HA Relay Cat. No., except for the 240V AC units, add (**-3-4L**).
❹ Push-to-test and Manual Override option: Add suffix **(-3)** to the selected Bulletin 700-HA relay.
❺ Bulk Package Option: Relay can be purchased at discounted prices in bulk quantities of 10. Add suffix (**-99**) to the selected relay catalog number.
❻ LED not available for 220V DC and 277V AC coils.
❼ Single pack
❽ Bulk pack

Bulletin 700-HAB Tube Base Relay with PIN Terminals (Bifurcated Contacts) — Mechanical ON/OFF Indicator included ❶

Description	Contact Rating	Wiring Diagrams		Coil Voltage	Cat. No. ❷❸❹	Factory-stocked Item ❺
		U.S./Canada	International			
DPDT 2-Pole 2 Form C Bifurcated AgNi Contacts	6 A			6V AC	700-HAB2A06	
				12V AC	700-HAB2A12	
				24V AC	700-HAB2A24	
				120V AC	700-HAB2A1	✔
				240V AC	700-HAB2A2	
				277V AC	700-HAB2A27 ❻	
				6V DC	700-HAB2Z06	
				12V DC	700-HAB2Z12	
				24V DC	700-HAB2Z24	✔
				36V DC	700-HAB2Z36	
				48V DC	700-HAB2Z48	
				110V DC	700-HAB2Z1	
				125V DC	700-HAB2Z01	
Sockets		*700-HN125*	*700-HN100* *700-HN202*	140V DC	700-HAB2Z3	
3PDT 3-Pole 3 Form C Bifurcated AgNi Contacts	6 A			6V AC	700-HAB3A06	
				12V AC	700-HAB3A12	
				24V AC	700-HAB3A24	
				120V AC	700-HAB3A1	✔
				240V AC	700-HAB3A2	
				6V DC	700-HAB3Z06	
				12V DC	700-HAB3Z12	
				24V DC	700-HAB3Z24	✔
				48V DC	700-HAB3Z48	
				110V DC	700-HAB3Z1	
				125V DC	700-HAB3Z01	
Sockets		*700-HN126*	*700-HN101* *700-HN203*	140V DC	700-HAB3Z3	

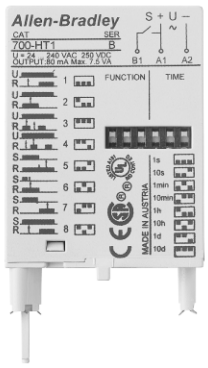
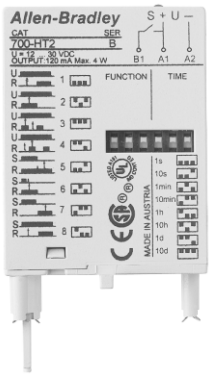
❶ For Time Module and Surge Suppressor Module, see page 47.
❷ LED Option: Add suffix **(-4)** to the selected Bulletin 700-HAB Relay Cat. No., except for the 240V AC Units, add (**-4L**).
❸ Push-to-test, Manual Override & Pilot Light Option: Add suffix **(-3 -4)** to the selected Bulletin 700-HAB Relay Cat. No., except for the 240V AC units, add (**-3 -4L**).
❹ Push-to-test and Manual Override option: Add suffix **(-3)** to the selected Bulletin 700-HA relay.
❺ Single Pack
❻ LED not available.

Bulletin 700-HAX Tube Base Relay with PIN Terminals (Bifurcated Contacts with Gold Overlay) — Mechanical ON/OFF Indicator Included ❶

Description	Contact Rating	Wiring Diagrams		Coil Voltage	Cat. No. ❷❸❹	Factory-stocked Item ❻
		U.S./Canada	International			
DPDT 2-Pole 2 Form C Bifurcated AgNi Contacts with Gold Overlay Sockets	6 A			6V AC	700-HAX2A06	
				12V AC	700-HAX2A12	
				24V AC	700-HAX2A24	
				120V AC	700-HAX2A1	✔
				240V AC	700-HAX2A2	
				277V AC	700-HAX2A27❺	
				6V DC	700-HAX2Z06	
				12V DC	700-HAX2Z12	
				24V DC	700-HAX2Z24	✔
				36V DC	700-HAX2Z36	
				48V DC	700-HAX2Z48	
				110V DC	700-HAX2Z1	
				125V DC	700-HAX2Z01	
Sockets		*700-HN125*	*700-HN100* *700-HN202*	140V DC	700-HAX2Z3	
3PDT 3-Pole 3 Form C Bifurcated AgNi Contacts with Gold Overlay	6 A			6V AC	700-HAX3A06	
				12V AC	700-HAX3A12	
				24V AC	700-HAX3A24	
				120V AC	700-HAX3A1	✔
				240V AC	700-HAX3A2	
				6V DC	700-HAX3Z06	
				12V DC	700-HAX3Z12	
				24V DC	700-HAX3Z24	✔
				48V DC	700-HAX3Z48	
				110V DC	700-HAX3Z1	
				125V DC	700-HAX3Z01	
Sockets		*700-HN126*	*700-HN101* *700-HN203*	140V DC	700-HAX3Z3	

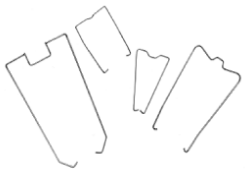
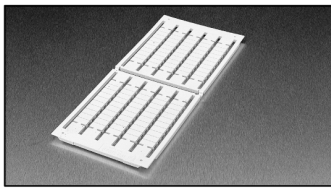
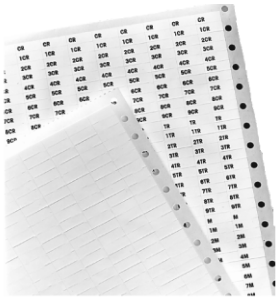
❶ For Time Module and Surge Suppressor Module, see page .
❷ LED Option: Add suffix **(-4)** to the selected Bulletin 700-HAX Relay Cat. No., except for the 240V AC Units, add (**-4L**).
❸ Push-to-test and LED Option: Add suffix **(-3-4)** to the selected Bulletin 700-HAX Relay Cat. No., except for the 240V AC units, add (**-3-4L**).
❹ Push-to-test and Manual Override option: Add suffix **(-3)** to the selected Bulletin 700-HA relay.
❺ LED not available.
❻ Single pack

	Description	Pkg. Qty.	Cat. No.	Factory-stocked Item
Cat. No. 700-HN100	**Screw Terminal Tube Base Sockets – Panel or DIN Rail Mounting. Guarded Terminal Construction** 8-pin for use with DPDT Bulletin 700-HA relays, -HX digital timing relays, -HT (ON-Delay) and -HRM, -HRC and -HV (Repeat Cycle) timing relays. Order must be for 10 sockets or multiples of 10.	10	700-HN100	✔
Cat. No. 700-HN125	**Screw Terminal Tube Base Sockets – Panel or DIN Rail Mounting Open Style Construction** 8-pin for use with DPDT Bulletin 700-HA relays, -HT (ON-Delay) and -HRM, -HRC and -HV (Repeat Cycle) timing relays. Order must be for 10 sockets or multiples of 10. No retainer clip required.	10	700-HN125	✔
Cat. No. 700-HN101	**Screw Terminal Tube Base Sockets – Panel or DIN Rail Mounting. Guarded Terminal Construction** 11-pin for use with 3PDT Bulletin 700-HA relays, -HR and -HT (OFF-Delay) timing relays. Order must be for 10 sockets or multiples of 10.	10	700-HN101	✔
Cat. No. 700-HN126	**Screw Terminal Tube Base Sockets – Panel or DIN Rail Mounting. Guarded Terminal Construction** 11-pin for use with 3PDT Bulletin 700-HA relays, -HR and -HT (OFF-Delay) timing relays. Order must be for 10 sockets or multiples of 10.	10	700-HN126	✔
Cat. No. 700-HN203	**8-Pin Socket – Can Be Used With or Without Timing Attachment or Surge Suppressor** Screw Terminal Tube Base Sockets – panel or DIN Rail mounting. Guarded terminal construction. Used with DPDT Bulletin 700-HA relays. Order must be for 10 sockets or multiples of 10.	10	700-HN202	✔
	11-Pin Socket – Can Be Used With or Without Timing Attachment or Surge Suppressor Screw Terminal Tube Base Sockets – panel or DIN Rail mounting. Guarded terminal construction. Used with 3PDT Bulletin 700-HA relays. Order must be for 10 sockets or multiples of 10.	10	700-HN203	✔
Cat. No. 199-DR1	**DIN Rail Mounting Pack** Standard 35 x 7.5 mm DIN Rail, 1 meter long, 10 rails per package. Order must be for 10 rails or multiples of 10.	10	199-DR1	✔

	Description	Pkg. Qty.	Cat. No.	Factory-stocked Item
Cat. No. 700-HSV1	**MOV Suppressor Module** ❶ Voltage Range: 24V AC 24…30V DC Order must be for 20 modules or multiples of 20.	20	700-HSV1	✔
	MOV Suppressor Module ❶ Voltage Range: 220…240V AC 220…300V DC Order must be for 20 modules or multiples of 20.	20	700-HSV2	✔
	MOV Suppressor Module ❶ Voltage Range: 110…120V AC 110…150V DC Order must be for 20 modules or multiples of 20.	20	700-HSV3	✔
Cat. No. 700-HSMD	**Diode Surge Suppressor** ❶ Voltage Range: 6…250V DC Order must be for 20 modules or multiples of 20.	20	700-HSMD	✔
 *Cat. No. 700-HT1*	**Multi-Function Multi-Range Time Module** ❶ Voltage range 24…240V AC 50/60 Hz and 24…250V DC, with a voltage variation of 85…110%. Repeat accuracy of <0.5%. Reset time 150 ms. Refer to page 50 for Specifications. Eight (8) Timing Modes Eight (8) Timing Ranges: 1. 1 s 2. 10 s 3. 1 min. 4. 10 min. 5. 1 hour 6. 10 hours 7. 1 day (24 hours) 8. 10 days (240 hours) LED Indicator: 1. Steady Green (G) for power on, flashing during timing.	1	700-HT1	✔
 *Cat. No. 700-HT2*	**Multi-Function Multi-Range Time Module** ❶ Voltage range 12…30V DC, with a voltage variation of 90…110%. Repeat accuracy of <0.5%. Reset time 150 ms. Refer to page 50 for Specifications. Eight (8) Timing Modes (See page 51 for further details.) Eight (8) Timing Ranges: 1. 1 s 2. 10 s 3. 1 min. 4. 10 min. 5. 1 hour 6. 10 hours 7. 1 day (24 hours) 8. 10 days (240 hours) LED Indicator: 1. Steady Green (G) for power on, flashing during timing	1	700-HT2	

❶ Suppressors and Time Modules easily plug into sockets (Cat. Nos. 700-HN202 and 700-HN203). For use with Bulletin 700-HA relays.

ATTENTION: Cat. No. 700-HT1 Series A is wired with switch "S" connected to "A2", but 700-HT1 Series B is wired with switch "S" connected to "A1". The Time Modules must be wired correctly. Check the front of the Time Modules for the correct wiring diagrams.

	Description	Pkg. Qty.	Cat. No.	Factory-stocked Item
 *Sample Retainer Clips*	**Retainer Clip for Cat. Nos. 700-HN100, -HN101, -HN200, -HN201, -HN202, and -HN203 Sockets with Bulletin 700-HA Relays** ❶ Secures relay in socket. Order must be for 10 clips or multiples of 10.	10	700-HN157	✔
 *Snap-in markers*	**Relay Identification Snap-in Markers** ❸ Snap-in markers fit on top of Bulletin 700-HA relay covers. The following are blank cards. Squares slip into molded slot on top of **Bulletin 700-HA** or **700-HB** relay cover.	100	1492-SM5X12 1492-SM6X9 1492-SM6X12 1492-SM8X9 1492-SM8X12 1492-MP-Blank	❷
	**Pre-printed identification tags –** contains 10 sheets of pre-printed and blank tags. Each sheet contains 13 sets of the markings CR…9CR, TR…9TR, M…9M, F, R, 1S, and 117 blank tags. Tags are peel-off with sticky backing for easy placement on relays.	10	700-N40	
	Blank identification tags – contains 10 sheets of blank identification tags for customer specialized printing. Each sheet contains 546 blank tags. Tags are peel-off with sticky backing for easy placement on relays.	10	700-N41	

❶ See Bulletin 700-HA Relay, Socket, and Retainer Clip Reference Chart
❷ Refer to terminal block marking systems within the Industrial Control Catalog, publication A113
❸ For pre-printed marker cards, turn to the following 1492 sections: 1492-SM5X12_, 1492-SM6X9_,1492-SM8X9_,1492-SM8X12_,1492-MP_

Relay Type	Socket	Retainer Clip
700-HA32 700-HAB2 700-HAX2	700-HN100 700-HN125 700-HN202 700-HN200	700-HN157 Not Required ❹ 700-HN157 700-HN157
700-HA33 700-HAB3 700-HAX3	700-HN201 700-HN101 700-HN126 700-HN203	700-HN157 700-HN157 Not Required ❹ 700-HN157

❹ Design of these sockets holds the relays securely and does not require retainer clips.

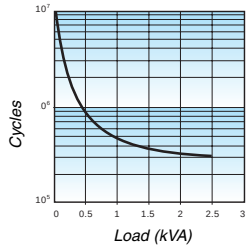
		Cat. No. 700-HA…		
Electrical Ratings				
Pilot Duty Rating ❷		NEMA B300		
Rated Thermal Current (I_{th})		HA = 10 A – 120V, 240V HAB/HAX = 6 A – 120V, 240V		
Rated Insulation Voltage (U_i)		250V IEC – 300V UL/CSA		
Contacts	Inductive	**Make**	**Break**	**Hp**
	120V AC 240V AC	►][◄ 30 A 15 A	◄][► 3 A 1.5 A	 0.33 1
	DC	30V DC, 10 A		
Min. Low Energy Permissible Load		HA = 10V, 50 mA HAB= 6V, 30 mA HAX = 6V, 1 mA		
Permissible Coil Voltage Variation		Pickup: 80…110% of Nominal Voltage at 50 Hz 80…110% of Nominal Voltage at 60 Hz 80…110% of Nominal Voltage at DC		Dropout: DC Coil 10% of nominal voltage AC Coil 15% of nominal voltage
Coil Consumption ±10%	AC Coils Inrush Sealed	**50 Hz** 3.3 VA 2.2 VA	**60 Hz** 2.85 VA 1.9 VA	
	DC Coils	1.3 W		
Max. Allowable Leakage		25% of VA		
		10% of W		
Max. Contact Resistance		50 MΩ (700-HA and 700-HB) 30 MΩ (700-HAX)		
Design Specification/Test Requirements				
Electrical				
Dielectric Withstand Voltage Pole-to-Pole Contact to Coil Contact to Frame		 2000V 2000V 2000V		
Electrical Life (Operating)		100,000 min.		
Mechanical				
Degree of Protection (Open Type) IEC 529		IP 40		
Mechanical Life Operations (AC/DC)		> 20 x 10^6/ 50 x 10^6		
Switching Frequency Operations		3600/HR		
Coil Voltages		See Product Selection		
Operating Time	Max. Pickup Max. Dropout	10 ms 10 ms		
Maximum Operating Rate		4 Ops/s		
Vibration	Endurance Operational	5 G 2.5 G		
Shock	Endurance Operational	50 G 9 G		
Environmental				
Temperature	Operating	AC/DC	–40…+70°C	
	Storage	AC/DC	–40…+100°C	
Altitude		2000 m (6560 ft)		
Construction				
Insulating Material		Molded High Dielectric Material		
Enclosure		Transparent Dust Cover		
Contact Material		700-HA: 10 A– AgNi 700-HAB: 4 A–Bifurcated AgNi 700-HAX: 4 A–Bifurcated/Gold Plating AgNi		
Terminal Markings on Socket		In accordance with EN50 0005		
Sockets		8-Pin Socket — 700-HN100, -HN125, -HN202 11-Pin Socket — 700-HN101, -HN126, -HN203		
Certifications		CE, cULus listed, IMQ, RINA, ABS		

❶ Performance Data – See page Important-2, Industrial Controls Catalog.
❷ NEMA Rating Chart is on page 19.

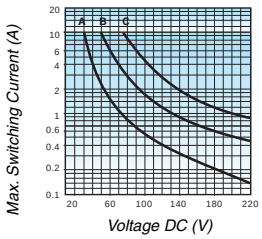
General Purpose Relays

Specifications, Continued ❶

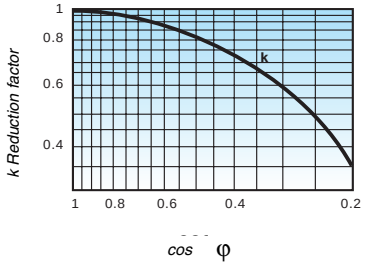
700-HA Relay Performance Graphs



Contact life vs. AC1 load at 1,800 cycles/h



Breaking capacity for DC1 load at 1800 cycles/h
***A=** load applied to 1 contact*
***B=** load applied to 2 contacts in series*
***C=** load applied to three contacts in series*

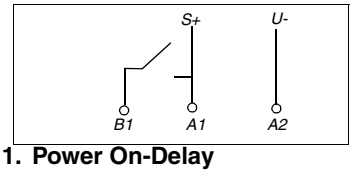


Load reduction factor vs. cos φ

		Time Module Cat. No. 700-HT1	Time Module Cat. No. 700-HT2
Electrical Ratings			
Operating Voltage Range		24…240V AC at 50/60 Hz 24…250V DC	12…30V DC
Power Consumption		24V AC/DC 70 mW 240V AC/DC 700 mW	12V DC 40 mW 30V DC 100 mW
Maximum Output Current		80 mA (2 W at 24V DC)	120 mA (2 W at 24V DC)
Maximum Output Voltage		265V AC, 275V DC	33V DC
Maximum Output Power		7.5 VA (30 mA at 240V AC)	4 W
Mechanical			
Degree of Protection of Input (B1) Terminal		IP 20 (Guarded Terminal)	
Input Terminal Wire Range		2 x 1.5 mm² (2 # 16 AWG…1 # 20 AWG)	
Input Terminal Torque Range		0.45…0.8 Nm (4…7 lb-in.)	
LED Indicator		Steady when Power On and Flashing during Timing Period	
Repeat Accuracy ❷		<0.5% or 5 ms	
Timing Change	Voltage Effect Temp. Effect	≤0.001%/V ≤0.01%/°C	≤0.001%/V ≤0.01%/°C
Reset Time		Power Reset: 150 ms Signal Reset: 50 ms AC, 30 ms DC	Power Reset: 150 ms Signal Reset: 10 ms DC
Selectable Timing Ranges		3 DIP Switches, 8 Ranges (set from 10…100% of range): 1 s, 10 s, 1 min., 10 min., 1 hr., 10 hr., 24 hr., 240 hr.	
Selectable Timing Modes		3 DIP Switches, 8 Modes: Power ON–Delay Single Shot – Power On Repeat Cycle – Starting with OFF-Delay Repeat Cycle – Starting with ON-Delay Signal OFF–Delay Single Shot – Signal is a Pulse Single Shot – Signal Off Signal ON–Delay	
Thumbwheel Scale Accuracy		≤5% of Time Range	
Environmental			
Temperature	Operating Storage	–25…+55°C (–13…+131°F) –55…+85°C (–67…+185°F)	
Altitude		2000 m (6560 ft)	
Construction			
Enclosure		Gray Plastic Housing	
Mounting with Socket Only		8- or 11-Pin Socket with Module Plug	
Sockets		700-HN202 (8-Pin with Plug) 700-HN203 (11-Pin with Plug)	
Certifications		CE, UL listed, CSA, cURus Recognized, File E3125 Guide NLDX 2, cULus listed with Allen-Bradley socket, CE-Marked (per EU Low Voltage Directive 73/23 EEC 93/68 EEC), ABS (American Bureau of Shipping), File 00-GE195140-PDA, RINA listed, IMQ listed	
Standards		EN 60947-4-1, EN 60947-5-1, IEC 947, CSA 22.2, UL 508, Nema/EE MAC compliant, ICS-2 compliant	

❶ Performance Data - See page Important-2, publication A113.
❷ At constant voltage and temperature.

Timing Charts, Cat. Nos. 700-HT1 and 700-HT2 Multi-Function Time Module (t = Time Range 0.10 s…240 h)



Terms:
U is Power Input (Steady Green LED)
R is Relay Output
S Control, **+A1** Socket, **B1** Timer
t is the resulting Time Delay (Flashing Green LED)

1. Power On-Delay

When the input voltage U is applied, the timing delay t begins. The relay contacts R change state after the time delay is complete. The contacts will return to their shelf state when the power U is removed. The terminal B1 is not used in this mode.

Power Reset Time: 150 ms min.

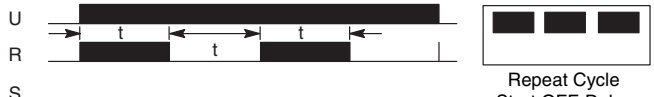
2. Single Shot — Power On

When the input voltage U is applied, the relay contacts R change state immediately and the timing cycle begins. When the time delay t is complete, the contacts return to shelf state. When the input voltage U is removed, the contacts return to their shelf state. The terminal B1 is not used in this mode.

Power Reset Time: 150 ms min.

3. Repeat Cycle — Starting with Relay Energized

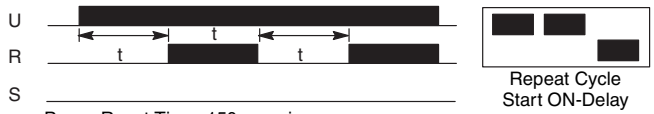
When the input voltage U is applied, the relay contacts R change state immediately and time delay t begins. When the time delay t is complete, the contacts return to their shelf state for time delay t. This cycle will repeat until the input voltage U is removed. The terminal B1 is not used in this mode.



Power Reset Time: 150 ms min.

4. Repeat Cycle — Starting with On-Delay

When the input voltage U is applied, the time delay t begins. When the time delay t is complete, the relay contacts R change state for the time delay t. This cycle will repeat until the input voltage U is removed. The terminal B1 is not used in this mode.



Power Reset Time: 150 ms min.

Cat. Nos. 700-HT1 and -HT2 Timing Modes, Time Description, Timing Charts, and DIP Switch Selections

5. Signal Off-Delay

The input voltage U must be applied continuously. When the control S (wired at B1) is energized, the relay contacts R change state. When the control S is de-energized, the delay t begins. When delay t is complete, the contacts R return to their shelf state. If signal S is energized before the time delay t is complete, then the Time Module is reset, the delay begins again, and the relay contacts remain in their energized state. If the input voltage U is removed, the relay contacts R return to their shelf state.

Min. Control Signal: HT1 – 50 ms AC, 30 ms DC
HT2 – 10 ms

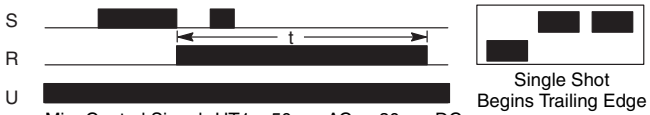
6. Single Shot — Signal Is a Pulse

The input U must be applied continuously. When the Control S (wired to B1 terminal) is energized, the relay contacts R change state and the time delay t begins. When the time delay t is completed, the contacts return to their shelf state. If signal S is de-energized before time t is completed, contacts R still stay in their changed state. The input signal S has control again when delay is completed or power reset. If the input voltage U is removed, the relay contacts R return to their shelf state.

Min. Control Signal: HT1 – 50 ms AC, 30 ms DC
HT2 – 10 ms

7. Single Shot — Signal Off

The input voltage U must be applied continuously. When the control S (wired at B1) is energized and then de-energized, the relay contacts R change state for the time delay t. If the control S is pulsed during the time period t, the relay contacts R will not be affected. If the input power is removed, the relay contacts R return to their shelf state.



Min. Control Signal: HT1 – 50 ms AC or 30 ms DC
HT2 – 10 ms

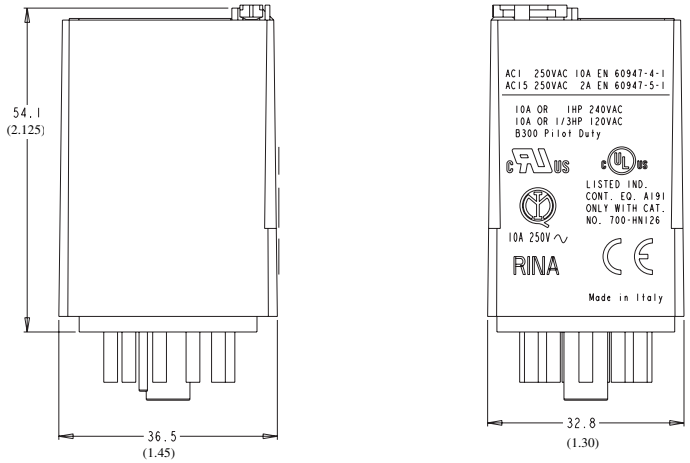
8. On Delay — Pulse Controlled

The input voltage U must be applied continuously. When the control S (wired at B1) is energized, the time delay t begins. When the time delay t is complete, the relay contacts R change state and remain energized until the control S is de-energized. If the input power U is removed the relay contacts R return to their shelf state.

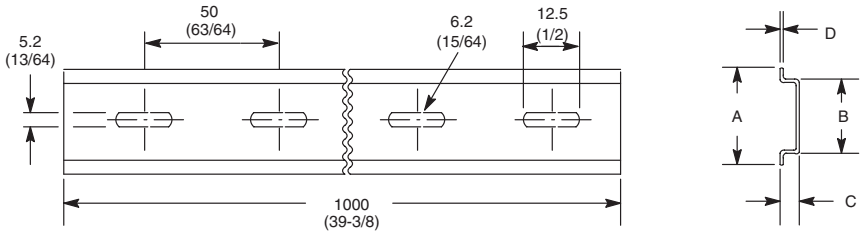
Min. Control Signal: HT1 – 50 ms AC or 30 ms DC
HT2 – 10 ms

Approximate Dimensions

Approximate Dimensions are shown in millimeters (inches). Approximate Dimensions are not intended to be used for manufacturing purposes.



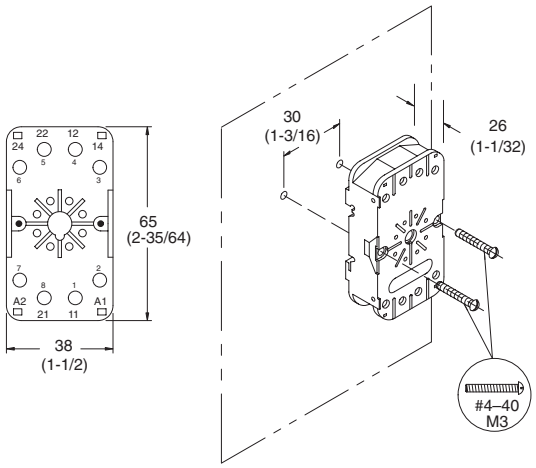
Bulletin 700-HA Relay



Cat. No. 199-DR1 DIN Mounting Rail Series B
Cat. No. 199-DR4 DIN Mounting Rail Series B Has No Mounting Holes

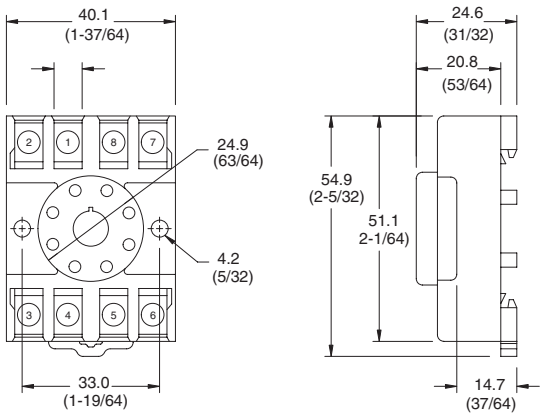
Cat. No.	A	B	C	D	Approx. Shipping Wt.
199-DR1	35 (1-3/8)	27 (1-1/16)	7.5 (19/64)	1.02 (1/64)	1.85 kg (4.07 lbs.) (10/pkg)
199-DR4	35 (1-3/8)	27 (1-1/16)	15 (19/32)	2.3 (3/32)	3.68 kg (8 lbs.) (5/pkg)

Approximate Dimensions are shown in millimeters (inches). Approximate Dimensions are not intended to be used for manufacturing purposes.



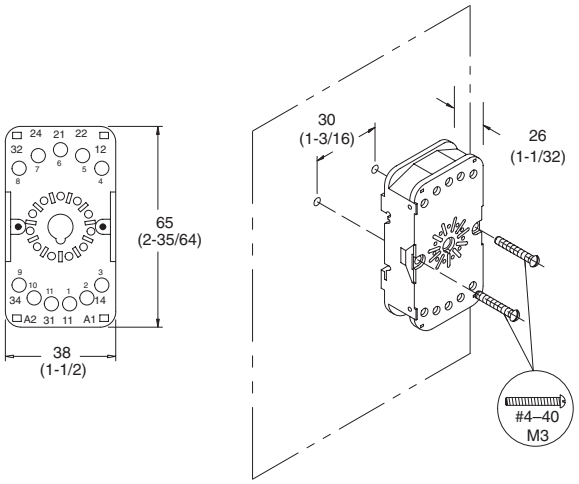
Cat. No. 700-HN100 *Panel Mounting*

Wire Size: 2 x 2.5 mm²
Single Wire – Up to #12 AWG
Double Wire – 2 x 2.5 mm² (#2–14 AWG… #2–20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8") – Torque: 0.8 Nm (7 lb.-in.)



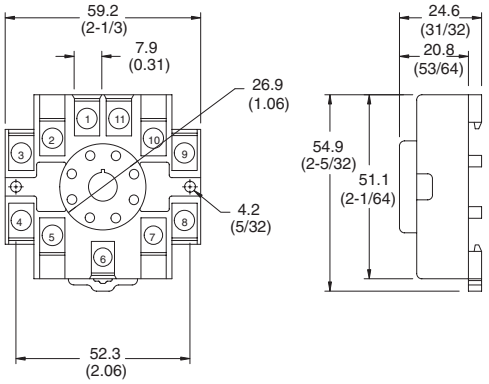
Cat. No. 700-HN125 ❶

Wire Size: 2 x 2.5 mm²
Single Wire – Up to 12 AWG
Double Wire – 2 x 2.5 mm² (#2–14 AWG…#2–20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8") – Torque: 0.8 Nm (7 lb.-in.)



Cat. No. 700-HN101 *Panel Mounting*

Wire Size: 2 x 2.5 mm²
Single Wire – Up to #12 AWG
Double Wire – 2 x 2.5 mm² (#2–14 AWG…#2–20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in") – Torque: 0.8 Nm (7 lb.-in.)

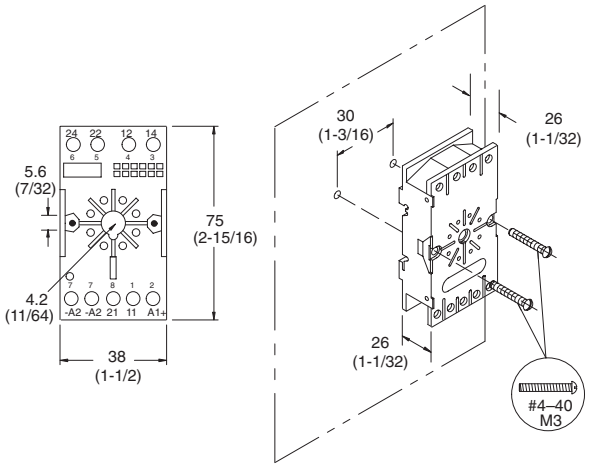


Cat. No. 700-HN126 ❶

Wire Size: 2 x 2.5 mm²
Single Wire – Up to #12 AWG
Double Wire – 2 x 2.5 mm² (#2–#14 AWG…#2–20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in.") – Torque: 0.8 Nm (7 lb.-in.)

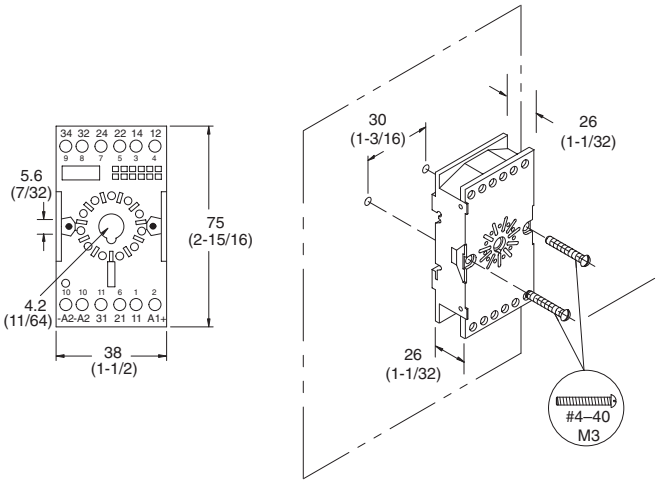
❶ Cat. No. 199-FSM Surge Suppressors fit on the coil terminals. See page 187.

Approximate Dimensions are shown in millimeters (inches). Approximate Dimensions are not intended to be used for manufacturing purposes.



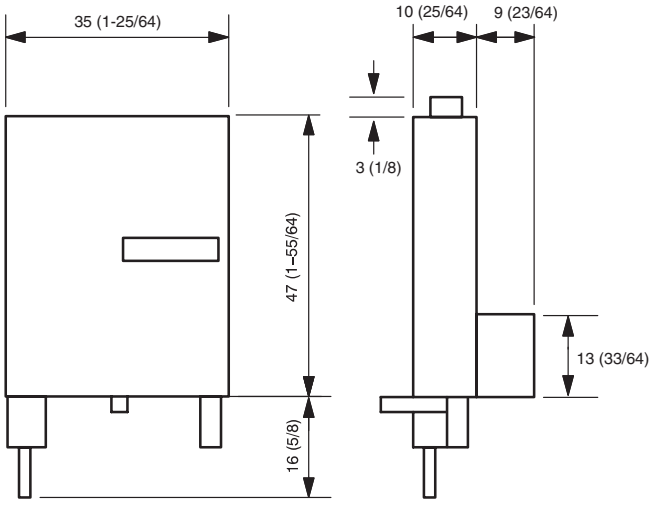
Cat. No. 700-HN202 *Panel Mounting*

Wire Size: 2 x 2.5 mm²
Single Wire – Up to #12 AWG
Double Wire – 2 x 2.5 mm² (#2–14 AWG… #2–20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in.) – Torque: 0.8 N•m (7 lb.-in.)

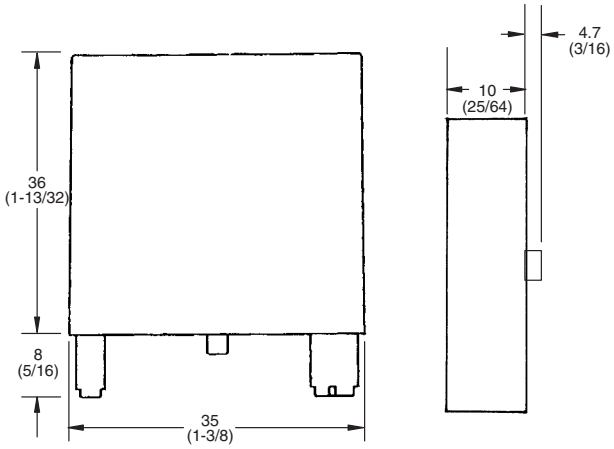


Cat. No. 700-HN203 *Panel Mounting*

Wire Size: 2 x 2.5 mm²
Single Wire – Up to #12 AWG
Double Wire – 2 x 2.5 mm² (#2–14 AWG …#2–20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in.) – Torque: 0.8 N•m (7 lb.-in.)



Cat. Nos. 700-HT1 and 700-HT2



Cat. Nos. 700-HSV1, 700-HSV2, 700-HSV3, and 700-HSMD

Wire Size: 2 x 1.5 mm² (#2 – 16 AWG…#1–20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in.) – Torque: 0.8 Nm (7 lb.-in.)

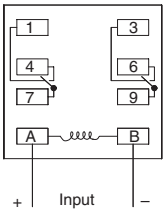
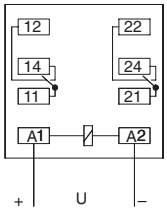
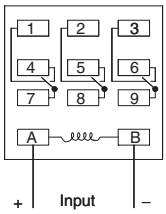
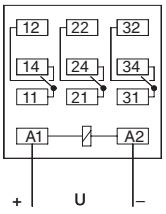
Bulletin 700-HB

- 15 A Contact Rating
- DPDT, 3PDT
- Blade Style Quick Connect Terminals
- Standard ON/OFF Flag Indicator
- Options: LED, Push-to-Test, and Manual Override

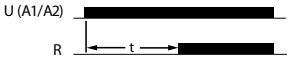
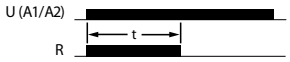
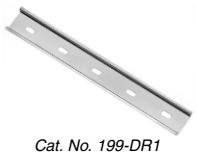
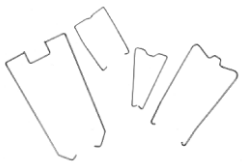
Table Of Contents

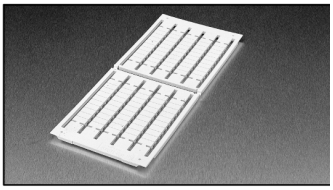
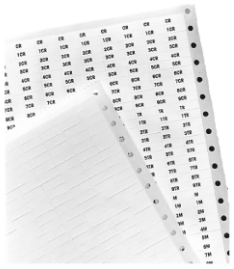
Product Selection 75
Accessories 76
Specifications 78
Approximate Dimensions 80

Bulletin 700-HB Square Base Relay with Blade Style Quick Connect/Solder Terminations — Mechanical ON/OFF Indicator Included

	Description	Contact Rating	Wiring Diagrams		Coil Voltage	Cat. No. ❶❷❹	Factory-stocked Item	
			U.S./Canada	International			❺	❻
Cat. No 700-HB…	DPDT 2-Pole 2 Form C Single AgCdO Contact	15 A B300	 700-HN154	 700-HN153	6V AC	700-HB32A06		
					12V AC	700-HB32A12		
					24V AC	700-HB32A24	✔	
					120V AC	700-HB32A1 ❸	✔	✔
					240V AC	700-HB32A2		
					6V DC	700-HB32Z06		
					12V DC	700-HB32Z12	✔	
					24V DC	700-HB32Z24	✔	
					48V DC	700-HB32Z48		
	Sockets				110V DC	700-HB32Z1		
	3PDT 3-Pole 3 Form C Single AgCdO Contact	15 A B300	 700-HN154	 700-HN153	6V AC	700-HB33A06		
					12V AC	700-HB33A12		
					24V AC	700-HB33A24	✔	
					120V AC	700-HB33A1 ❸	✔	✔
					240V AC	700-HB33A2		
					6V DC	700-HB33Z06		
					12V DC	700-HB33Z12	✔	
					24V DC	700-HB33Z24 ❸	✔	
					48V DC	700-HB33Z48		
	Sockets				110V DC	700-HB33Z1		

❶ LED Option: Add suffix **(-4)** to the selected Bulletin 700-HB Relay Cat. No., except for the 240V AC Units, add (**-4L**).
❷ Push-to-test, Manual Override, and LED Option: Add suffix **(-3-4)** to the selected Bulletin 700-HB Relay Cat. No., except for the 240V AC units, add (**-3-4L**).
❸ Bulk Package Option: Relay can be purchased at discounted prices in bulk quantities of 10. Add suffix (**-99**) to the selected relay Catalog Number. The following relays are also available in the Bulk Package Option: Cat. Nos. 700-HB33A1-4 and 700-HB33Z24-4.
❹ Push-to-test and Manual Override option: Add suffix **(-3)** to the selected Bulletin 700-HB relay.
❺ Single Pack.
❻ Bulk pack

	Description	Pkg. Qty.	Cat. No.	Factory-stocked Item
	Diode with LED Surge Suppressor Voltage Range: 6…24V DC used with 700-HN153 socket	10	700-ADL1R	✔
	Diode with LED Surge Suppressor Voltage Range: 28…60V DC used with 700-HN153 socket	10	700-ADL2R	✔
	Diode with LED Surge Suppressor Voltage Range: 110…220V DC used with 700-HN153 socket	10	700-ADL3R	✔
	Varistor with LED Surge Suppressor Used with 700-HN153 Socket Voltage Range: 6…24V AC used with 700-HN153 socket	10	700-AV1R	✔
	Varistor with LED Surge Suppressor Used with 700-HN153 Socket Voltage Range: 110…240V AC used with 700-HN153 socket	10	700-AV3R	✔
	RC Surge Suppressor Voltage Range: 6…24V AC/DC used with 700-HN153 socket	10	700-AR1	✔
	RC Surge Suppressor Voltage Range: 110…240V AC/DC used with 700-HN153 socket	10	700-AR2	✔
 Cat. No. 700-AT2	**ON-Delay Time Module** Voltage Range: 12…24V AC/DC used with 700-HN104 socket 	1	700-AT1	available Oct. 02'
	One Shot Timing Module Voltage Range: 12…24V AC/DC used with 700-HN153 socket 	1	700-AT2	available Oct. 02'
 Cat. No. 700-HN153	**Screw Terminal Socket – Panel or DIN Rail Mounting. Guarded Terminal Construction** 11-blade socket for use with Bulletin 700-HB and -HJ relays and -HS timing relays. Order must be for 10 sockets or multiples of 10. Safe separation between coil and contacts.	10	700-HN153	✔
 Cat. No. 700-HN154	**Screw Terminal Base Socket – Panel or DIN Rail Mounting. Open Style Construction** 11-blade for use with Bulletin 700-HB and -HJ relays and -HS timing relays. Order must be for 10 sockets or multiples of 10.	10	700-HN154	✔
 *Cat. No. 199-DR1*	**DIN Rail Mounting Pack** Standard 35 x 7.5 mm DIN Rail, 1 meter long, 10 rails per package. Order must be for 10 rails or multiples of 10.	10	199-DR1	✔
 *Sample Retainer Clips*	**Retainer Clip for Cat. No. -HN154 open terminal socket with 700-HB relays ❶** Secures relay in socket. Order must be for 10 clips or multiples of 10.	10	700-HN156	✔
	Retainer clip for cat. nos. 700-HN 153 guarded terminal socket with 700-HB relays ❶ **Secures relay in socket. Order must be for 10 clips or multiples of 10.**	10	700-HN158	✔

	Description	Pkg. Qty.	Cat. No.	Factory-stocked Item
 *Snap-in markers*	**Relay Identification Snap-in Markers ❸** Snap-in markers fit on top of Bulletin 700-HA relay covers. The following are blank cards. Squares slip into molded slot on top of **Bulletin 700-HA** or **700-HB** relay cover.	100	1492-SM5X12 1492-SM6X9 1492-SM6X12 1492-SM8X9 1492-SM8X12 1492-MP-Blank	❷
	**Pre-printed identification tags –** contains 10 sheets of pre-printed and blank tags. Each sheet contains 13 sets of the markings CR…9CR, TR…9TR, M…9M, F, R, 1S, and 117 blank tags. Tags are peel-off with sticky backing for easy placement on relays.	10	700-N40	
	Blank identification tags – contains 10 sheets of blank identification tags for customer specialized printing. Each sheet contains 546 blank tags. Tags are peel-off with sticky backing for easy placement on relays.	10	700-N41	

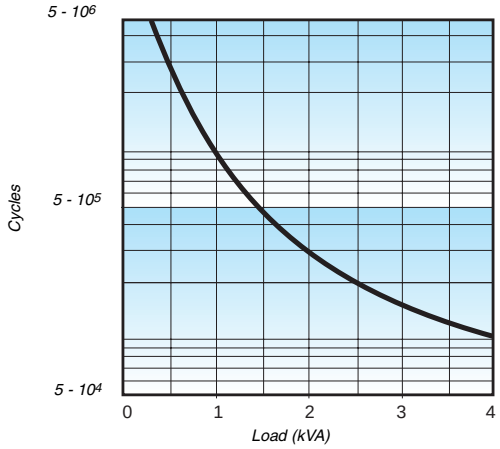
❶ Bulletin 700-HB Square Base Relay, Socket, and Retainer Clip Reference Chart.
❷ Refer to terminal block marking systems within the Industrial Control Catalog.
❸ For pre-printed marker cards, turn to the following 1492 sections of publication A113: 1492-SM5X12_, 1492-SM6X9_,1492-SM8X9_ ,1492-SM8X12_,1492-MP_ .

Relay Type	Socket Cat. No.	Retainer Clip Cat. No.
700-HB	700-HN153 700-HN154	700-HN158 700-HN156

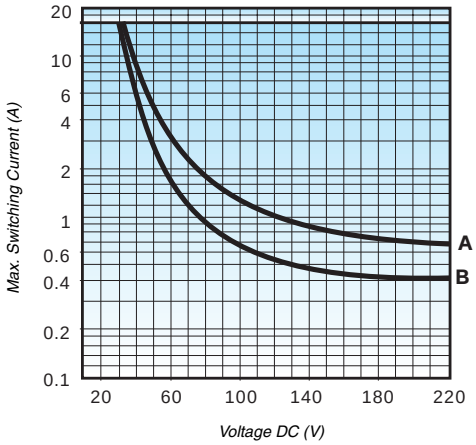
		Cat. No. 700-HB…		
Electrical Ratings				
Pilot Duty Rating ❷		NEMA B300		
Rated Thermal Current (I_{th})		15 A – 120V, 240V		
Rated Insulation Voltage (U_i)		250V IEC-300V UL/CSA		
Contacts	Inductive	**Make**	**Break**	**Hp**
	120V AC 240V AC	►][◄ 60 A 30 A	◄][► 6 A 3 A	 3/4 2
	DC Resistive	30V DC, 15 A		
Min. Low Energy Permissible Load		10V 50 mA		
Permissible Coil Voltage Variation		80…110% of Nominal Voltage at 50 Hz 80…110% of Nominal Voltage at 60 Hz 80…110% of Nominal Voltage at DC		
Coil Consumption ±10%	AC Coils Inrush Sealed	**50 Hz** 3.0 VA 2.0 VA	**60 Hz** 2.85 VA 1.9 VA	
	DC Coils	1.3 W		
Max. Allowable Leakage		25% of VA		
		10% of W		
Max. Contact Resistance		30 mΩ		
Design Specification/Test Requirements				
Electrical				
Dielectric Withstand Voltage Pole-to-Pole Contact to Coil Contact to Frame		 2500V 4000V 2500V		
Mechanical				
Degree of Protection (Open Type) IEC 529		IP 40		
Mechanical Life Operations		> 10 x 10^6 /30 x 10^6		
Switching Frequency Operations		3600/HR		
Coil Voltages		See Overview/Product Selection		
Operating Time (ms)	Pickup Dropout	15 ms 15 ms		
Maximum Operating Rate		4 Ops/s		
Vibration	Endurance Operational	5 G 2.5 G		
Shock	Endurance Operational	50 G 15 G		
Environmental				
Temperature	Operating	AC/DC	–40…+70°C	
	Storage	AC/DC	–40…+100°C	
Altitude		2000 m (6560 ft)		
Construction				
Insulating Material		Molded High Dielectric Material		
Enclosure		Transparent Dust Cover		
Contact Material		AgCdO		
Terminal Markings on Socket		In accordance with EN50 0005		
Sockets		700-HN153, -HN154		
Certifications		CE, cULus, cURus, IMQ, RINA, ABS, cURus Recognized, File E3125Guide NLDX 2, cULus Listed, with Allen-Bradley socket, CE Marked (per EU Low Voltage Directive 73/23 EEC 93/68 EEC), ABS (American Bureau of Shipping), File 00-GE 195140-PDA, RINA listed, IMQ listed		
Standards		EN 60947-4-1, EN 60947-5-1, IEC 947CSA 22.2, UL 508, NEMA/EEMAC, ICS2 compliant		

❶ Performance Data – See page Important 2, publication A113.
❷ NEMA Rating Chart is on page 19.

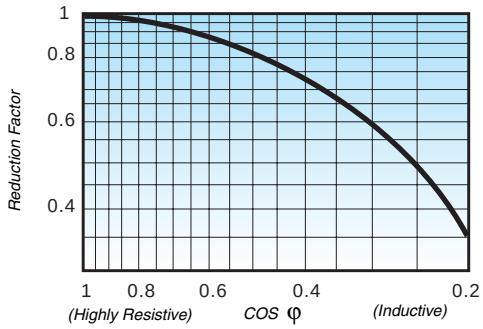
Technical Data



Contact life vs AC1 load at 600 cycles/h.

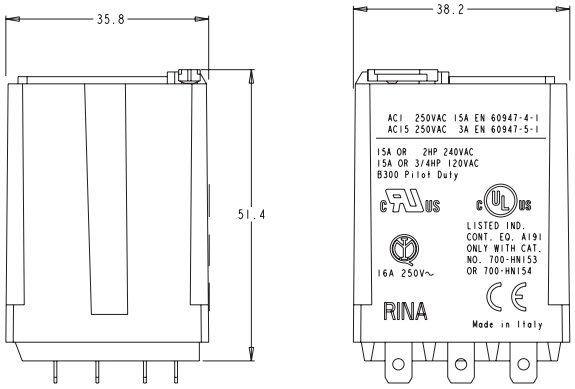


Breaking capacity for DC1 load at 600 cycles/h.
Load applied to 1 contact.
A = for N.O. types
B= other types

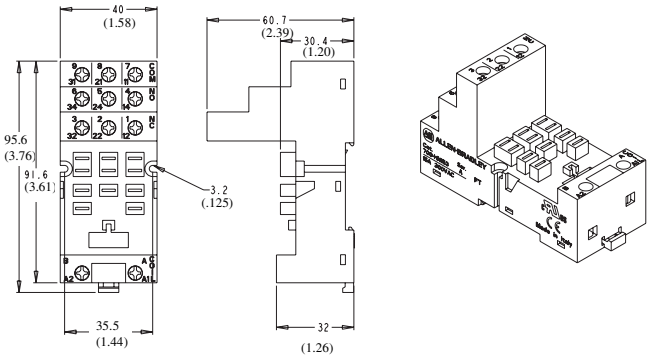


Load Reduction factor vs cos φ

Approximate Dimensions are shown in millimeters (inches). Approximate Dimensions are not intended to be used for manufacturing purposes.

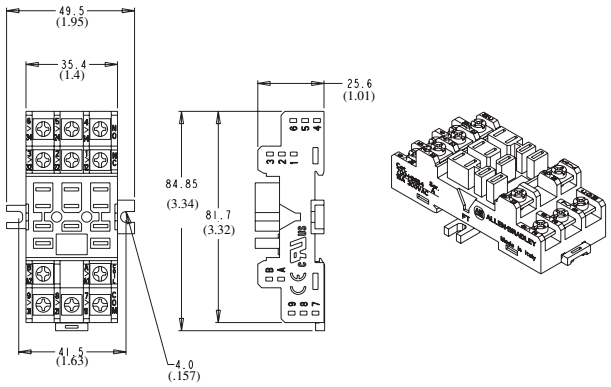


Bulletin 700-HB Relay



Cat. No. 700-HN153

Wire Size: 2 x 2.5 mm²
Single Wire – Up to #12 AWG
Double Wire – 2 x 2.5 mm² (#2–14 AWG… #2–20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in.) – Torque: 0.8 Nm (7 lb.-in.)



Cat. No. 700-HN154 ❶

Wire Size: 2 x 2.5 mm²
Single Wire – Up to #12 AWG
Double Wire – 2 x 2.5 mm² (#2–14 AWG… #2–20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in.) – Torque: 0.8 Nm (7 lb.-in.)

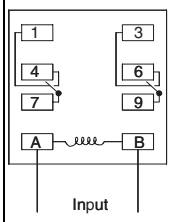
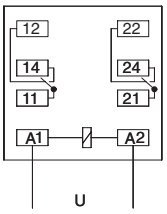
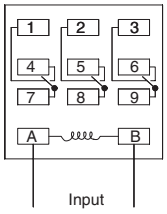
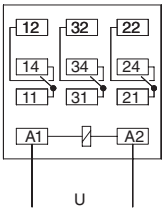
❶199-FSM Surge Suppressors fit on the coil terminals. See page 187.

Bulletin 700-HD

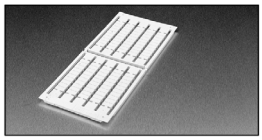
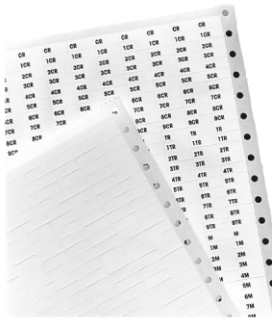
- Flange Mounted/Panel Mounted
- 15 A Contact Rating
- DPDT, 3PDT
- Blade Style Quick Connect Terminals (0.187 x 0.020 in.)
- Solder Terminals

Table of Contents

Product Selection 81
Accessories 82
Specifications 83
Approximate Dimensions 84

Description	Contact Rating	Wiring Diagrams		Coil Voltage	Cat. No.	Factory-stocked Item ❶
		U.S./Canada	International			
DPDT 2-Pole 2 Form C AgCdO Contacts	15 A			6V AC	700-HD32A06	
				12V AC	700-HD32A12	
				24V AC	700-HD32A24	✔
				120V AC	700-HD32A1	✔
				240V AC	700-HD32A2	
				6V DC	700-HD32Z06	
				12V DC	700-HD32Z12	
				24V DC	700-HD32Z24	✔
				48V DC	700-HD32Z48	
				110V DC	700-HD32Z1	
3PDT 3-Pole 3 Form C AgCdO Contacts	15 A			6V AC	700-HD33A06	
				12V AC	700-HD33A12	
				24V AC	700-HD33A24	
				120V AC	700-HD33A1	
				208V AC	700-HD33A20	✔
				240V AC	700-HD33A2	✔
				6V DC	700-HD33Z06	
				12V DC	700-HD33Z12	
				24V DC	700-HD33Z24	
				48V DC	700-HD33Z48	
				110V DC	700-HD33Z1	

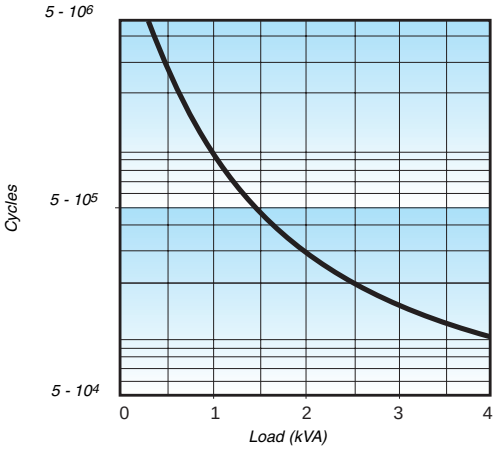
❶ Single Pack

	Description	Pkg. Qty.	Cat. No.	Factory-stocked Item
 *Snap-in markers*	**Relay Identification Snap-in Markers** ❶ Snap-in markers fit on top of Bulletin 700-HA relay covers. The following are blank cards. Squares slip into molded slot on top of **Bulletin 700-HD** relay cover.	100	1492-SM5X12 1492-SM6X9 1492-SM6X12 1492-SM8X9 1492-SM8X12 1492-MP-Blank	❷
	**Pre-printed identification tags –** contains 10 sheets of pre-printed and blank tags. Each sheet contains 13 sets of the markings CR…9CR, TR…9TR, M…9M, F, R, 1S, and 117 blank tags. Tags are peel-off with sticky backing for easy placement on relays.	10	700-N40	
	Blank identification tags – contains 10 sheets of blank identification tags for customer specialized printing. Each sheet contains 546 blank tags. Tags are peel-off with sticky backing for easy placement on relays.	10	700-N41	

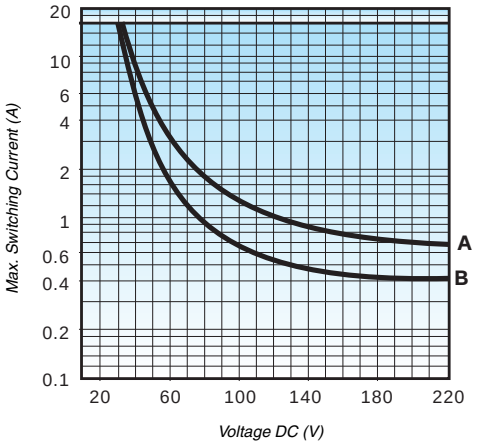
❶ Refer to terminal block marking systems within the Industrial Control Catalog.
❷ For pre-printed marker cards, turn to the following 1492 sections of publication A113: 1492-SM5X12_, 1492-SM6X9_,1492-SM8X9_, 1492-SM8X12_,1492-MP_.

		Cat. No. 700-HD…		
Electrical Ratings				
Pilot Duty Rating ❷		NEMA B300		
Rated Thermal Current (I_{th})		15 A ❸ – 120V 15 A ❸ – 240V		
Rated Insulation Voltage (U_i)		250V IEC-300V UL/CSA		
Contacts	Inductive	**Make**	**Break**	**Hp**
	120V AC 240V AC	►][◄ 60 A 30 A	◄][► 6 A 3 A	 3/4 2
	DC	30V DC, 15 A		
Permissible Coil Voltage Variation		80…110% of Nominal Voltage at 50 Hz 80…110% of Nominal Voltage at 60 Hz 80…110% of Nominal Voltage at DC		
Coil Consumption ±10%	AC Coils Inrush Sealed	**50 Hz** 3.3 VA 2.2 VA	**60 Hz** 2.25 VA 1.9 VA	
	DC Coils	1.3 W		
Maximum Contact Resistance		30 MΩ		
Design Specification/Test Requirements				
Electrical				
Dielectric Withstand Voltage Pole-to-Pole Contact to Coil Contact to Frame		 2500V 4000V 2500V		
Mechanical				
Degree of Protection (Open Type) IEC 529		IP 40		
Mechanical Life Operations (AC/DC)		> 10 x 10^6 / 30 x 10^6		
Switching Frequency Operations		3600/HR		
Coil Voltages		See Overview/Product Selection		
Operating Time	Pickup Dropout	15 ms 15 ms		
Maximum Operating Rate		4 Ops/s		
Minimum Low Energy Permissible Load		50 mW		
Environmental				
Temperature	Operating	–40…+70°C		
	Storage	–40…+100°C		
Altitude		2000 m (6560 ft)		
Construction				
Insulating Material		Molded High Dielectric Material		
Enclosure		Transparent Dust Cover		
Contact Material		Silver Cad. Ox.		
Terminal Markings on Socket		In accordance with EN50 0005		
Certifications and Approvals		CE, cURus, IMQ, RINA, ABS, cURus Recognized, File E3125, Guide NLDX 2, CE Marked (per EU Low Voltage Directive 73/23 EEC 93/68 EEC),ABS (American Bureau of Shipping), File 00-GE 195140-PDA, RINA listed, IMQ listed		
Conformity to Standards		EN 60947-4-1,EN 60947-5-1,IEC 947,CSA 22.2,UL 508,NEMA/EEMAC ICS2 compliant		

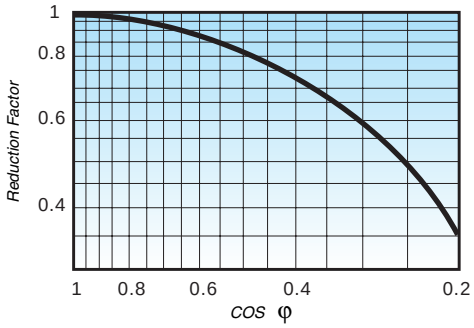
❶ Performance Data – See page Important-2., publication A113
❷ NEMA Rating Chart is on page 19.
❸ 3-pole relays have a 20 A maximum total current rating for all three poles.
❹ Bulletin 700-HD wiring terminals are the quick connect/solder type 4.7 mm x 0.5 mm (0.187 x 0.020") termination.



Contact life vs AC1 load at 600 cycles/h.



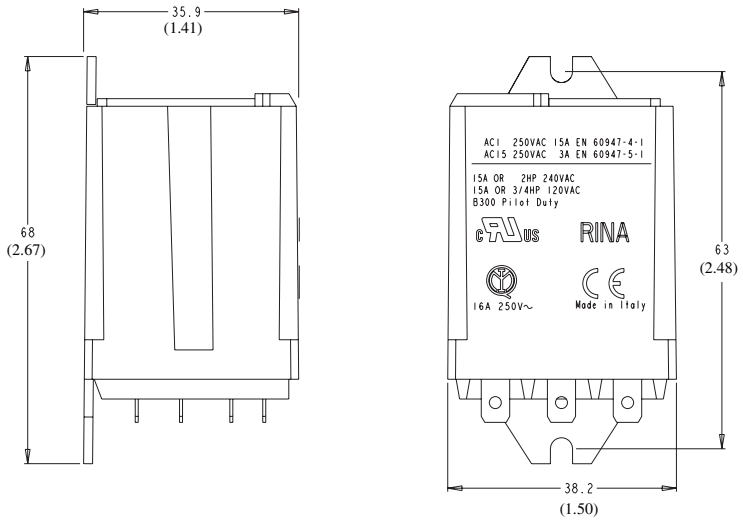
Breaking capacity for DC1 load at 600 cycles/h.
Load applied to 1 contact.
A = for N.O. types
B= other types



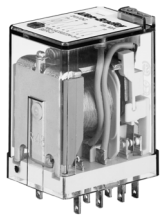
Load Reduction factor vs cos φ

Approximate Dimensions

Approximate Dimensions are shown in millimeters (inches). Approximate Dimensions are not intended to be used for manufacturing purposes.



Bulletin 700-HD Relay



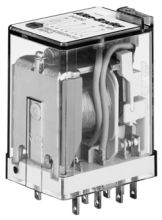
Bulletin 700-HC

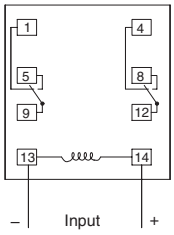
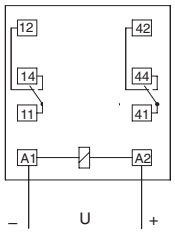
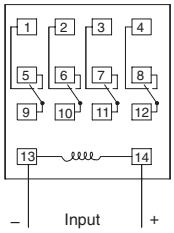
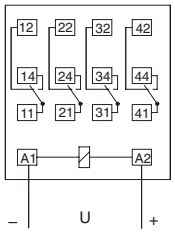
- 7 A or 10 A Contact Ratings
- 2PDT or 4PDT
- Standard ON/OFF Flag Indicator
- Blade Style Terminals
- Choice of Standard Silver Nickel Contacts, or Silver Nickel With Gold Plated Contacts for Low Energy Applications
- Options: LED, Push-to-Test with Manual Override Option

Table Of Contents

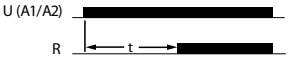
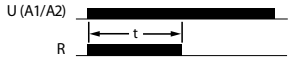
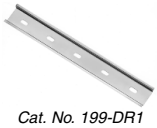
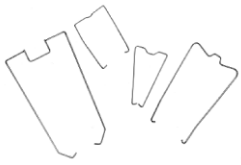
Product Selection **85**
Accessories **86**
Specifications **87**
Approximate Dimensions **88**

Bulletin 700-HC Miniature Square Base with Blade Terminals



Description	Contact Rating	Wiring Diagrams		Coil Voltage	Cat. No. ❶ ❷	Factory-stocked Item ❸
		U.S./Canada	International			
2PDT 2-Pole 2 Form C Contacts: 10 A = AgNi Contacts	10 A C300 R300 Low energy rating; (10V, 10 mA)	 *700-HN128*	 *700-HN103* *700-HN104*	12V DC	700-HC22Z12	
				24V DC	700-HC22Z24	✔
				24V AC	700-HC22A24	
				120V AC	700-HC22A1 ❹	✔
				240V AC	700-HC22A2	
4PDT 4-Pole 4 Form C Contacts: 7A = AgNiAu Gold Plated Contacts	7 A Low energy rating; (10V, 1 mA)	 *700-HN128*	 *700-HN103* *700-HN104*	6V AC	700-HC14A06	
				12V AC	700-HC14A12	
				24V AC	700-HC14A24	✔
				120V AC	700-HC14A1 ❸	✔
				240 AC	700-HC14A2	✔
				6V DC	700-HC14Z06	
				12V DC	700-HC14Z12	✔
				24V DC	700-HC14Z24 ❸	✔
				48V DC	700-HC14Z48	
				110V DC	700-HC14Z1	
4PDT 4-Pole 4 Form C Contacts: 7A = AgNi Silver Contacts	7 A C300 R300 Low energy rating; (10V, 10 mA)			6V AC	700-HC24A06	
				12V AC	700-HC24A12	
				24V AC	700-HC24A24 ❸	✔
				120V AC	700-HC24A1 ❸	✔
				240V AC	700-HC24A2	✔
				6V DC	700-HC24Z06	
				12V DC	700-HC24Z12	✔
				24V DC	700-HC24Z24 ❸	✔
				48V DC	700-HC24Z48	✔
				110V DC	700-HC24Z1	

❶ LED Option: Add suffix **(-4)** to the selected Bulletin 700-HC Relay Cat. No. except for the 240V AC units, add (**-4L**).
❷ Push-to-Test and LED Option: Add suffix **(-3-4)** to the selected Bulletin 700-HC Relay Cat. No., except for the 240V AC units, add (**-3-4L**).
❸ Single Pack
❹ Bulk Package Option: Relay can be purchased at discounted prices in bulk quantities of 10. Add suffix (**-99**) to the selected relay Catalog Number.

	Description	Pkg. Qty.	Cat. No.	Factory-stocked Item
	Diode with LED Surge Suppressor Voltage Range: 6…24V DC used with 700-HN104 socket	10	700-ADL1	✔
	Diode with LED Surge Suppressor Voltage Range: 28…60V DC used with 700-HN104 socket	10	700-ADL2	✔
	Diode with LED Surge Suppressor Voltage Range: 110…220V DC used with 700-HN104 socket	10	700-ADL3	✔
	Varistor with LED Surge Suppressor Used with 700-HN153 Socket Voltage Range: 6…24V AC used with 700-HN104 socket	10	700-AV1R	✔
	Varistor with LED Surge Suppressor Used with 700-HN153 Socket Voltage Range: 110…240V AC used with 700-HN104 socket	10	700-AV3R	✔
	RC Surge Suppressor Voltage Range: 6…24V AC/DC used with 700-HN104 socket	10	700-AR1	✔
	RC Surge Suppressor Voltage Range: 110…240V AC/DC used with 700-HN104 socket	10	700-AR2	✔
 Cat. No. 700-AT2	**ON-Delay Time Module** Voltage Range: 12…24V AC/DC used with 700-HN104 socket 	1	700-AT1	available Oct. 02’
	One Shot Timing Module Voltage Range: 12…24V AC/DC used with 700-HN153 socket 	1	700-AT2	available Oct. 02’
 Cat. No. 700-HN103	**Screw Terminal Socket – Panel or DIN Rail Mounting. Guarded Terminal Construction** 14-blade miniature socket for use with Bulletin 700-HC relays.	1	700-HN103	✔
 Cat. No. 700-HN104	**Screw Terminal Socket – Panel or DIN Rail Mounting. Guarded Terminal Construction** 14-blade miniature socket for use with Bulletin 700-HC relays. This socket has coil and contact separation as well as the ability to plug in optional plug in modules (700-A accessories: LED, Surge Suppression, Timing Modules)	10	700-HN104	✔
 Cat. No. 700-HN128	**Screw Terminal Base Sockets – Panel or DIN Rail Mounting. Open Style Construction** 14-blade miniature socket for use with Bulletin 700-HC relays. Order must be for 10 sockets or multiples of 10.	10	700-HN128	✔
 *Cat. No. 199-DR1*	**DIN Rail Mounting Pack** Standard 35 x 7.5 mm DIN Rail, 1 meter long, 10 rails per package. Order must be for 10 rails or multiples of 10.	10	199-DR1	✔
 *Sample Retainer Clips*	**Retainer Clip for Cat. Nos. 700-HN103, and -HN128 Sockets with 700-HC Relays and Cat. Nos. 700-HN116, Sockets with Bulletin 700-HF DPDT Relays ❶** Secures relay in socket. Order must be for 10 clips or multiples of 10.	10	700-HN114	✔
	Plastic Retainer and Ejection Lever For use with the 700-HN104 Sockets for 700-HC relays. Built-in ability to accept 1492 Snap-in Markers	10	700-HN124	✔

❶ Bulletin 700-HC Miniature Square Base Relay, Socket, and Retainer Clip Reference Chart

Relay Type	Socket Cat. No.	Retainer Clip Cat. No.
700-HC	700-HN103 700-HN128 700-HN104	700-HN114 700-HN114 700-HN114 or 700-HN124

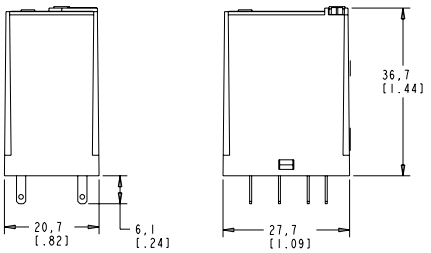
		Cat. No. 700-HC…					
Electrical Ratings							
Pilot Duty Rating ❷		NEMA C300, R300					
Rated Thermal Current (I_{th})		7 A and 10 A					
Rated Insulation Voltage (U_i)		250V IEC – 300V UL/CSA					
Contacts	Inductive	**700-HC_4**		**Hp**	**700-HC22**		**Hp**
		►][◄	◄][►		►][◄	◄][►	
	120V AC	15 A	1.5 A	1/8	15 A	1.5 A	1/3
	240V AC	7.5 A	0.75 A	1/3	7.5 A	0.75 A	3/4
	DC	24V DC, 7 A			24V DC, 10 A		
Permissible Coil Voltage Variation		80…110% of Nominal Voltage at 50 Hz 80…110% of Nominal Voltage at 60 Hz 80…110% of Nominal Voltage at DC					
Coil Consumption ±10%		**50 Hz**			**60 Hz**		
AC Coils	Inrush	2.2 VA			1.6 VA		
	Sealed	1.3 VA			1.1 VA		
DC Coils		1.0 W					
Max. Allowable Leakage		20% of VA					
		10% of W					
Design Specification/Test Requirements							
Electrical							
Dielectric Withstand Voltage							
Pole-to-Pole		1600V					
Contact to Coil		1600V					
Contact to Frame		1600V					
Electrical Life		100,000 minimum					
Mechanical							
Degree of Protection (Open Type) IEC 529		IP 20 (Guarded Terminal Sockets)					
Mechanical Life Operations		20 x 10^6 (AC) 50 x 10^6 (DC)					
Switching Frequency Operations		1800/HR					
Coil Voltages		See Product Selection					
Operating Time (ms)	Max. Pickup	10					
	Max. Dropout	15					
Maximum Operating Rate		16 cycles/s					
Environmental							
Temperature	Operating	–30…+55°C (–22…+131°F)					
	Storage	–55…+85°C (–67…+185°F)					
Altitude		2000 m (6560 ft)					
Construction							
Insulating Material		Molded High Dielectric Material					
Enclosure		Transparent Dust Cover					
Contact Material		AgNi, AgNi + 5 µm All					
Terminal Markings on Socket		In accordance with EN50 0005					
Sockets		700-HN103, -HN128, -HN104					
Certifications		cULus Listed, cURus recognized, IMQ, ABS, RINA, CE Marked					
Standards		EN 60947-4-1, EN 60947-5-1,IEC 947,CSA 22.2, UL 508					

❶ Performance Data – See page Important-2, publication A113.
❷ NEMA Rating Chart is on page 187.

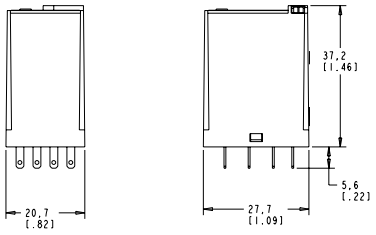
Interposing/Isolation Relays

Approximate Dimensions

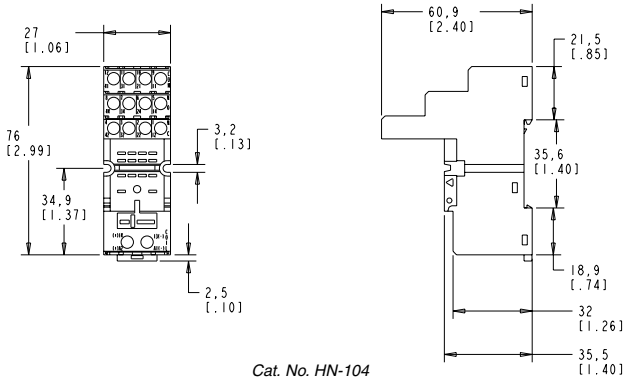
Approximate Dimensions are shown in millimeters (inches). Approximate Dimensions are not intended to be used for manufacturing purposes.



Bulletin 700-HC Relay (Two-Pole)

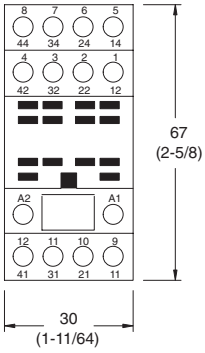


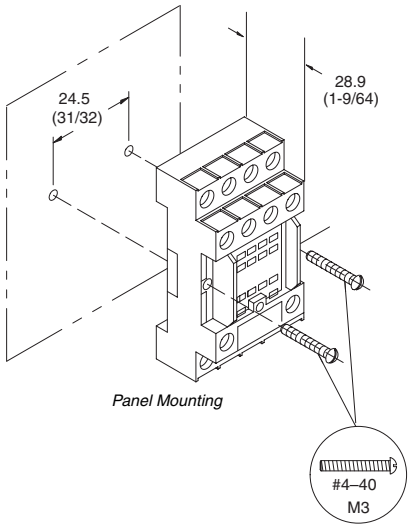
Bulletin 700-HC Relay (Four-Pole)



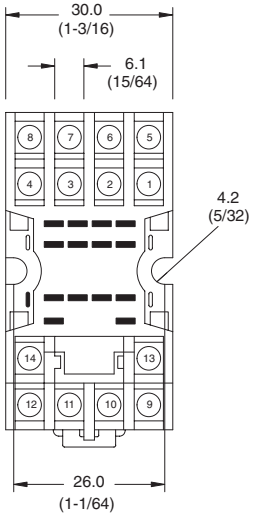
Cat. No. HN-104

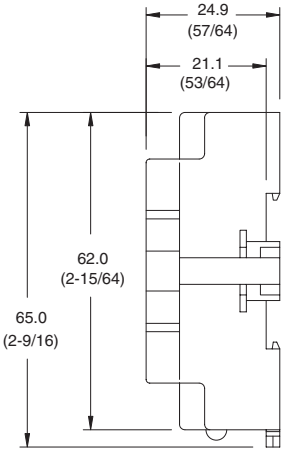
Single Wire: 0.2 mm2.....2.5 mm2 (#24 AWG.....14 AWG)
Double Wire: 2 X 0.2 mm2.....2 X 2.5 mm2 (2 X 24 AWG.....2 X 14 AWG)
Wire Type: solid or stranded, copper only
Strip Length: 7 mm (9/32 in.), Torque: 0.5 Nm (4.4 lb.-in.)





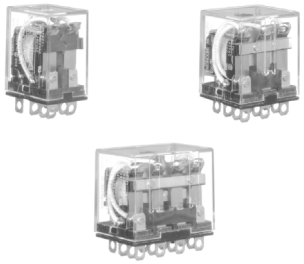
Cat. No. 700-HN103





Cat. No. 700-HN128

Wire Size: 2 x 1.5 mm² (# 2–16 AWG…#1–20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in.) – Torque: 0.8 Nm (7 lb.-in.)



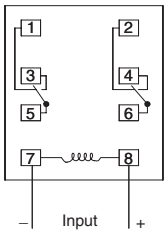
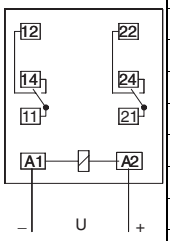
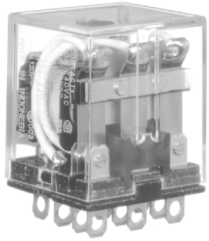
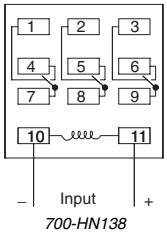
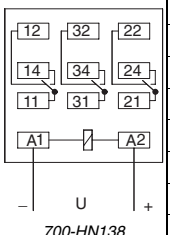
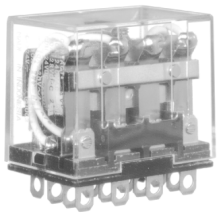
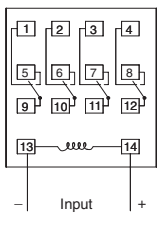
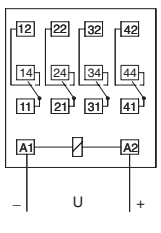
Bulletin 700-HF

- 10 A Contact Rating
- DPDT, 3PDT, 4PDT
- Plug-in Quick Connect Solder Terminals
- Options: LED, Push-to-Test Operator

Table Of Contents

Product Selection **89**
Accessories **90**
Specifications **91**
Approximate Dimensions **92**

Square Base with Quick Connect/Solder Style Terminations

	Description	Contact Rating	Wiring Diagrams U.S./Canada	Wiring Diagrams International	Coil Voltage	Cat. No. ❶ ❷	Factory-stocked Item ❸	Factory-stocked Item ❹
	DPDT 2-pole 2 Form C AgCdO Contacts Socket	10 A	 *700-HN116*	 *700-HN116*	6V AC	700-HF32A06		
					12V AC	700-HF32A12		
					24V AC	700-HF32A24❺	✔	✔
					120V AC	700-HF32A1❺	✔	
					240V AC	700-HF32A2	✔	
					6V DC	700-HF32Z06		
					12V DC	700-HF32Z12	✔	
					24V DC	700-HF32Z24❺	✔	
					48V DC	700-HF32Z48		
					110V DC	700-HF32Z1		
	3PDT 3-pole 3 Form C AgCdO Contacts Socket	10 A	 *700-HN138*	 *700-HN138*	6V AC	700-HF33A06		
					12V AC	700-HF33A12		
					24V AC	700-HF33A24 ❻	✔	
					120V AC	700-HF33A1 ❻	✔	
					240V AC	700-HF33A2 ❻	✔	
					6V DC	700-HF33Z06		
					12V DC	700-HF33Z12 ❻		
					24V DC	700-HF33Z24 ❻	✔	
					48V DC	700-HF33Z48 ❻		
					110V DC	700-HF33Z1		
	4PDT 4-pole 4 Form C AgCdO Contacts Socket	10 A	 *700-HN139*	 *700-HN139*	6V AC	700-HF34A06		
					12V AC	700-HF34A12		
					24V AC	700-HF34A24 ❻	✔	
					120V AC	700-HF34A1 ❻	✔	
					240V AC	700-HF34A2	✔	
					6V DC	700-HF34Z06		
					12V DC	700-HF34Z12		
					24V DC	700-HF34Z24 ❻	✔	
					48V DC	700-HF34Z48 ❻		
					110V DC	700-HF34Z1		

❶ Pilot Light Option: Add suffix **(-4)** to the selected Bulletin 700-HF Relay Cat. No. except for the 240V AC units, add (**-4L**).
❷ Manual Operator and LED Option: Add suffix **(-1-4)** to the selected Bulletin 700-HF Relay Cat. No., except for the 240V AC units, add (**-1-4L**).
❸ Single Pack
❹ Bulk Pack
❺ Bulk Package Option: Relay can be purchased at discounted prices in bulk quantities of 50. Add suffix (**-99**) to the selected relay Catalog Number. The following relay is also available in the Bulk Package Option: Cat. No. 700-HF32A1-4.
❻ Bulk Package Option: Relay can be purchased at discounted prices in bulk quantities of 20. Add suffix (**-99**) to the selected relay Catalog Number. The following relays are also available in the Bulk Package Option: Cat. Nos. 700-HF33A1-4, 700-HF33Z24-4, 700-HF34A24-4, 700-HF34A1-4, and 700-HF34Z24-4.

	Description	Pkg. Qty.	Cat. No.	Factory-stocked Item
Cat. No 700-HN116	**Screw Terminal Socket – Panel or DIN Rail Mounting** 8-blade miniature socket for use with DPDT Bulletin 700-HF relays. Order must be for 10 sockets or multiples of 10.	10	700-HN116	✔
Cat. No. 700-HN138	**Screw Terminal Socket – Panel or DIN Rail Mounting** 11-blade socket for use with 3PDT Bulletin 700-HF relays.	1	700-HN138	✔
Cat. No. 700-HN139	**Screw Terminal Socket – Panel or DIN Rail Mounting** 14-blade socket for use with 4PDT Bulletin 700-HF relays.	1	700-HN139	✔
Cat. No 199-DR1	**DIN Rail Mounting Pack** Standard 35 x 7.5 mm DIN Rail, 1 meter long, 10 rails per package. Order must be for 10 rails or multiples of 10.	10	199-DR1	✔
Sample Retainer Clips	**Retainer Clip for Cat. Nos. 700-HN103, -HN104, -HN105, and -HN128 Sockets with 700-HC Relays and Cat. Nos. 700-HN116, -HN117 and -HN118 Sockets with Bulletin 700-HF DPDT Relays ❶** Secures relay in socket. Order must be for 10 clips or multiples of 10.	10	700-HN114	✔
	Retainer Clip for Cat. Nos. 700-HN138 and -HN139 Sockets with Bulletin 700-HF 3PDT and 4PDT Relays ❶ Secures relay in socket. Order must be for 10 clips or multiples of 10.	10	700-HN140	✔

❶ Bulletin 700-HF Square Base Relay, Socket, and Retainer Clip Reference

Relay Type	Cat. No. Socket	Cat. No. Retainer Clip
700-HF32	700-HN116	700-HN114
700-HF33	700-HN138	700-HN140
700-HF34	700-HN139	700-HN140

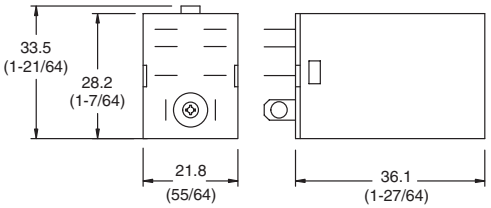
		Cat. No. 700-HF…		
Electrical Ratings				
Pilot Duty Rating		C300		
Rated Thermal Current (I_{th})		10 A		
Rated Insulation Voltage (U_i)		250V IEC, 300 UL/CSA		
Contacts	Inductive	**Make**	**Break**	**Hp**
	120V AC 240V AC	►][◄ 30 A 15 A	◄][► 3 A 1.5 A	 1/3 1/2
	DC	30V DC, 10 A		
Permissible Coil Voltage Variation		85…110% of Nominal Voltage at 50 Hz 85…110% of Nominal Voltage at 60 Hz 80…110% of Nominal Voltage at DC		
Coil Consumption ±10%		**50 Hz**	**60 Hz**	
AC Coils	Inrush Sealed	2.4 VA 1.6 VA	2.1 VA 1.4 VA	
DC Coils		0.9 W		
Max. Allowable Leakage		25% of VA		
		10% of W		
Design Specification/Test Requirements				
Dielectric Withstand Voltage	Pole-to-Pole	1500V AC		
	Contact to Pole	1500V AC		
	Contact to Frame	1500V AC		
Mechanical				
Degree of Protection		Open Type (Sockets)		
Mechanical Life Operations		30 x 10^6		
Switching Frequency Operations		3600/hr		
Coil Voltages		See Product Selection		
Operating Time at Nominal Voltage at 20°C	Pickup Dropout	15 ms 15 ms		
Maximum Operating Rate		4 Ops/s		
Shock (Mechanical Durability) Shock (Malfunction Durability)		100 G 20 G		
Environmental				
Temperature	Operating	–30…+55°C (–22…+131°F)		
	Storage	–55…+85°C (–67…+185°F)		
Altitude		2000 m (6560 ft)		
Construction				
Insulating Material		Molded High Dielectric Material		
Enclosure		Transparent Dust Cover		
Contact Material		Silver Cad. Ox.		
Terminal Markings on Socket		In accordance with EN50 0005		
Sockets		8-Blade Socket (DPDT) Cat. No. 700-HN116 11-Blade Socket (3PDT) Cat. No. 700-HN138 14-Blade Socket (4PDT) Cat. No. 700-HN139		
Certifications		CSA Certified, File LR75088, UL Recognized, File E3125,Guide NLDX 2, CE Marked (per EU Low Voltage Directive 73/23 EEC 93/68 EEC)		
Standards		CSA 22.2, UL 508, pr EN 60255-1-0, IEC 255-1-00, IEC 255-0-20		

❶ Performance Data – See page Important-2, publication A113.

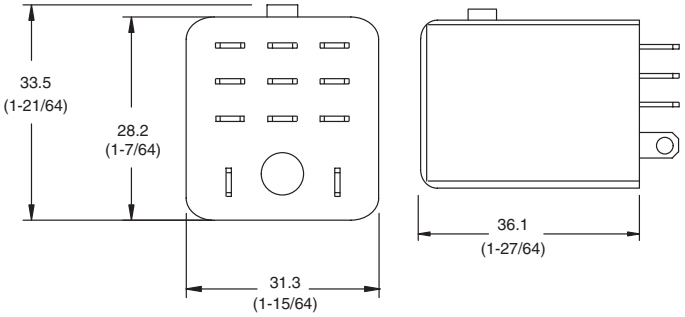
General Purpose Relays

Approximate Dimensions

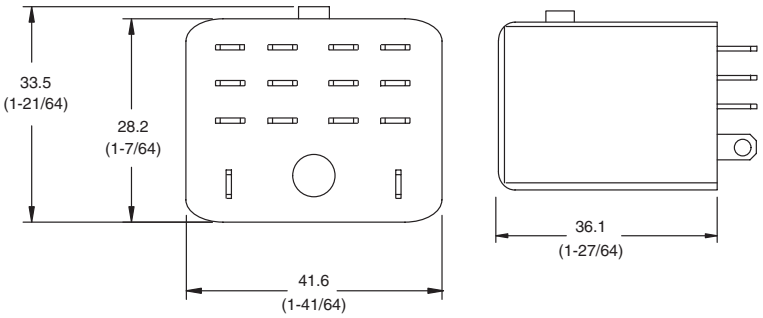
Approximate Dimensions are shown in millimeters (inches). Approximate Dimensions are not intended to be used for manufacturing purposes.



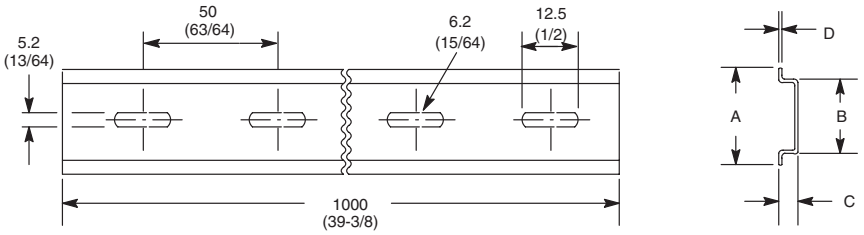
Bulletin 700-HF Relay (DPDT)



Bulletin 700-HF (3PDT)



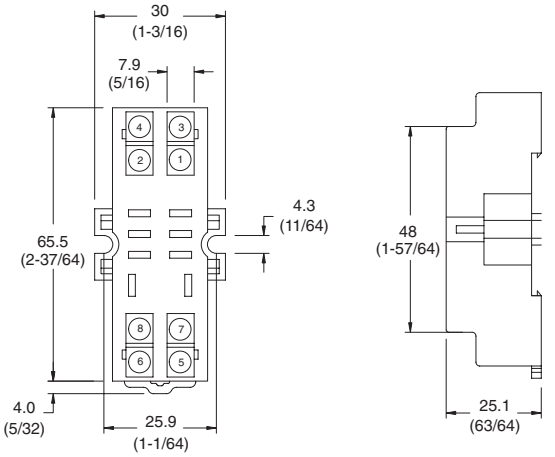
Bulletin 700-HF (4PDT)



Cat. No. 199-DR1 DIN Mounting Rail Series B
Cat. No. 199-DR4 DIN Mounting Rail Series B Has No Mounting Holes

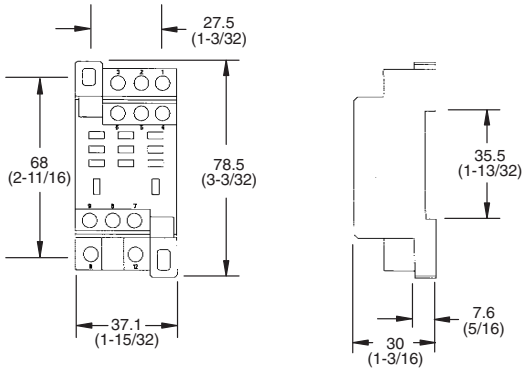
Cat. No.	A	B	C	D	Approx. Shipping Wt.
199-DR1	35 (1-3/8)	27 (1-1/16)	7.5 (19/64)	1.02 (1/64)	1.85 kg (4.07 lbs.) (10/pkg)
199-DR4	35 (1-3/8)	27 (1-1/16)	15 (19/32)	2.3 (3/32)	3.68 kg (8 lbs.) (5/pkg)

Approximate Dimensions are shown in millimeters (inches). Approximate Dimensions are not intended to be used for manufacturing purposes.



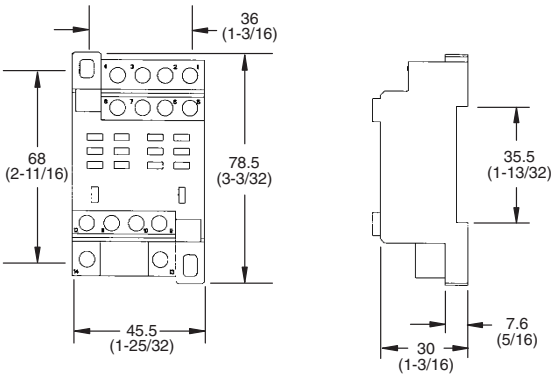
Cat. No. 700-HN116

Wire Size: 2 x 2.5 mm²
Single Wire – Up to #12 AWG
Double Wire – 2 x 2.5 mm² (#2–14 AWG… #2–20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in.) – Torque: 0.8 N•m (7 lb.-in.)



Cat. No. 700-HN138

Wire Size: 2 x 2.5 mm²
Single Wire – Up to #12 AWG
Double Wire – 2 x 2.5 mm² (#2–14 AWG… #2–20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in.) – Torque: 0.8 Nm (7 lb.-in.)



Cat. No. 700-HN139

Wire Size: 2 x 2.5 mm²
Single Wire – Up to #12 AWG
Double Wire – 2 x 2.5 mm² (#2–14 AWG… #2–20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in.) – Torque: 0.8 Nm (7 lb.-in.)

Bulletin 700-HJ

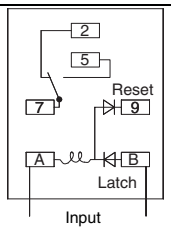
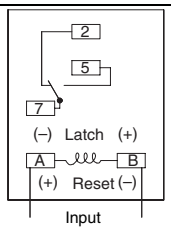
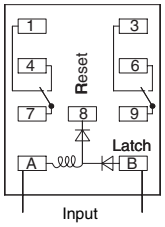
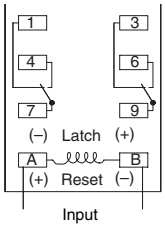
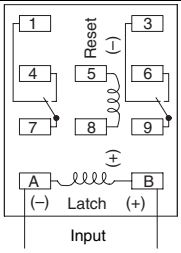
- Magnetic Latching Relay
- 10 A Contact Rating
- SPDT
- DPDT Single Coil
- DPDT Dual Coil
- Blade Style Quick Connect Terminals

Table Of Contents

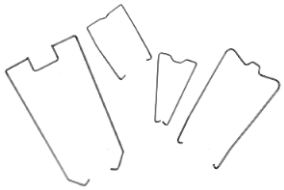
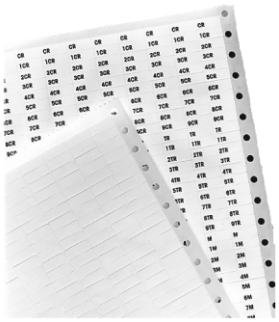
Product Selection 94
Accessories 95
Specifications 96
Approximate Dimensions 97

Bulletin 700-HJ Magnetic Latching Relay with Blade 0.187 x 0.020" Quick Connect/Solder Terminations

Type HJ

Description	Contact Rating	Wiring Diagrams AC ❶	Wiring Diagrams DC ❷	Coil Voltage	Cat. No.	Factory-stocked Item ❸
SPDT 1-Pole 1 Form C AgCdO Contacts (Single Coil AC or DC) Sockets	10 A	 *700-HN153*	 *700-HN154*	24V AC	700-HJ36A24	
				120V AC	700-HJ36A1	
				24V DC	700-HJ36Z24	
DPDT 2-Pole 2 Form C AgCdO Contacts (Single Coil AC or DC) Sockets	10 A	 *700-HN153*	 *700-HN154*	24V AC	700-HJ32A24	
				120V AC	700-HJ32A1	✔
				240V AC	700-HJ32A2	
				12V DC	700-HJ32Z12	
				24V DC	700-HJ32Z24	
DPDT 2-Pole 2 Form C AgCdO Contacts (Dual Coil) ❹ Socket	10 A	DC Only	 *700-HN153 or 700-HN154*	24V DC	700-HJD32Z24	✔

❶ AC Relays include internal diodes.
❷ For DC operation, polarity must be observed.
❸ Single Pack
❹ Available only in DC Coil with DPDT contacts.

	Description	Pkg. Qty.	Cat. No.	Factory-stocked Item
Cat. No. 700-HN153	**Screw Terminal Socket – Panel or DIN Rail Mounting. Guarded Terminal Construction** 11-blade socket for use with Bulletin 700-HB and -HJ relays and HS timing relays.	1	700-HN153	✔
Cat. No. 700-HN154	**Screw Terminal Base Socket – Panel or DIN Rail Mounting. Open Style Construction** 11-blade for use with Bulletin 700-HB and -HJ relays and -HS timing relays. Order must be for 10 sockets or multiples of 10.	10	700-HN154	✔
Cat. No. 199-DR1	**DIN Rail Mounting Pack** Standard 35 x 7.5 mm DIN Rail, 1 meter long, 10 rails per package. Order must be for 10 rails or multiples of 10.	10	199-DR1	✔
 *Sample Retainer Clips*	**Retainer Clip** **For Cat. Nos. 700-HN153 and -HN154 Sockets with Bulletin 700-HJ Relays ❶** Secures relay in socket. Order must be for 10 clips or multiples of 10.	10	700-HN159	✔
	**Pre-printed identification tags –** contains 10 sheets of pre-printed and blank tags. Each sheet contains 13 sets of the markings CR…9CR, TR…9TR, M…9M, F, R, 1S, and 117 blank tags. Tags are peel-off with sticky backing for easy placement on relays.	10	700-N40	
	Blank identification tags – contains 10 sheets of blank identification tags for customer specialized printing. Each sheet contains 546 blank tags. Tags are peel-off with sticky backing for easy placement on relays.	10	700-N41	

❶ Bulletin 700-HJ Magnetic Latching Relay, Socket, and Retainer Clip Reference Chart

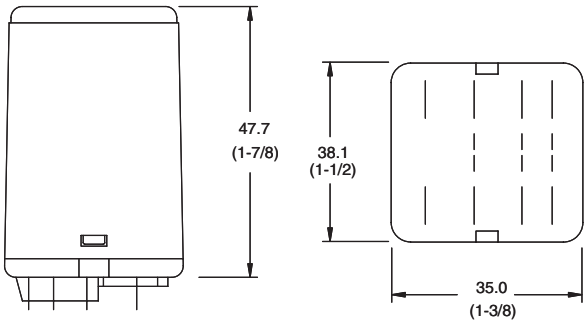
Relay Type	Socket Cat. No.	Retainer Clip Cat. No.
700-HJ	700-HN153	700-HN159
	700-HN154	700-HN159

Specifications ❶

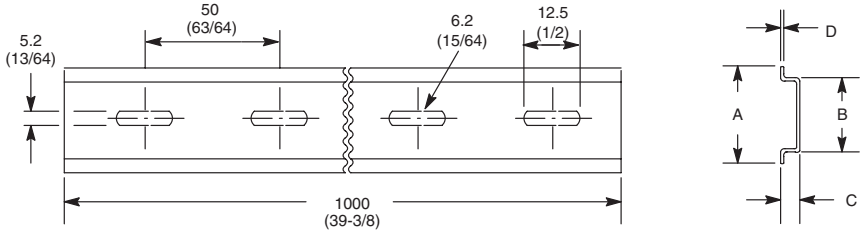
		Cat. No. 700-HJ…		
Electrical Ratings				
Pilot Duty Rating		—		
Rated Thermal Current (I_{th})		10 A		
Rated Insulation Voltage (U_i)		250V IEC, 300V UL/CSA		
Contacts	Inductive	**Make**	**Break**	**Hp**
	120V AC 240V AC	►][◄ 30 A 15 A	◄][► 3 A 1.5 A	 1/4 1/3
	DC	24V DC, 10 A		
Permissible Coil Voltage Variation		85…110% of Nominal Voltage at 50 Hz 85…110% of Nominal Voltage at 60 Hz 80…110% of Nominal Voltage at DC		
Coil Consumption ±10%		**Single AC Coil**	**Single DC Coil**	**Dual DC Coil**
AC Coils	Inrush	1.44 VA	—	—
	Sealed	1.44 VA		
DC Coils		—	1.2 W	12V 1.63 W 24V 1.67 W
Design Specification/Test Requirements				
Dielectric Withstand Voltage	Pole-to-Pole	1500V AC		
	Contact-to-Pole	1500V AC		
	Contact-to-Frame	1500V AC		
Mechanical				
Degree of Protection		Open Type (Guarded Terminal Sockets)		
Mechanical Life Operations		10×10^6		
Switching Frequency Operations		1800/HR		
Coil Voltages		See Product Selection		
Operating Time at Nominal Voltage at 20°C	Pickup	25 ms		
	Dropout	25 ms		
Maximum Operating Rate		—		
Environmental				
Temperature	Operating	–45…+50°C (–49…+122°F)		
	Storage	–45…+100°C (–49…+212°F)		
Altitude		2000 m (6560 ft.)		
Construction				
Insulating Material		Molded High Dielectric Material		
Enclosure		Transparent Dust Cover		
Contact Material		Silver Cad. Ox.		
Terminal Markings on Socket		In accordance with EN50 0005		
Sockets		11-Blade Socket Cat. No. 700-HN153 Cat. No. 700-HN154		
Certifications		CSA Certified, File LR7000260,UL Recognized, File E3125, Guide NLDX 2		
Standards		EN 60947-4-1, EN 60947-5-1,IEC 947,CSA 22.2,UL 508		

❶ Performance Data - See page Important-2, publication A113.

Approximate Dimensions are shown in millimeters (inches). Approximate Dimensions are not intended to be used for manufacturing purposes.

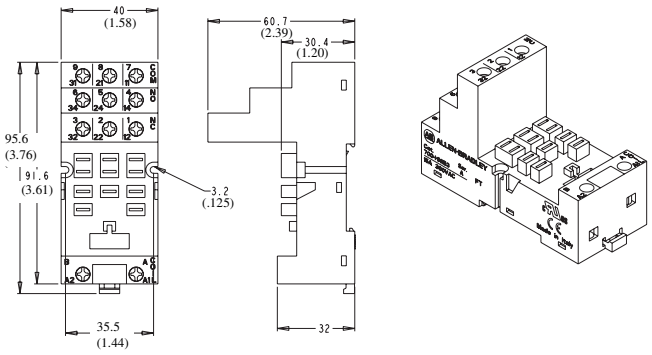


Bulletin 700-HJ Relay



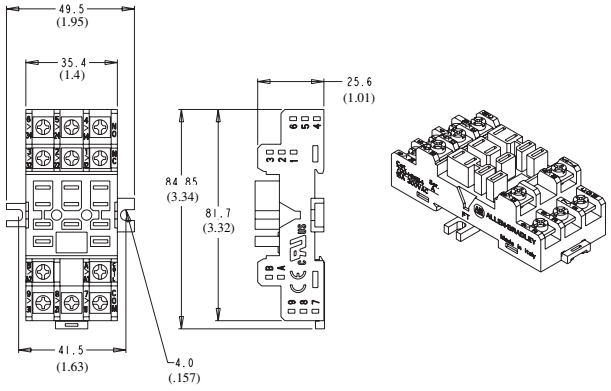
Cat. No. 199-DR1 DIN Mounting Rail Series B
Cat. No. 199-DR4 DIN Mounting Rail Series B Has No Mounting Holes

Cat. No.	A	B	C	D	Approx. Shipping Wt.
199-DR1	35 (1-3/8)	27 (1-1/16)	7.5 (19/64)	1.02 (1/64)	1.85 kg (4.07 lbs.) (10/pkg)
199-DR4	35 (1-3/8)	27 (1-1/16)	15 (19/32)	2.3 (3/32)	3.68 kg (8 lbs.) (5/pkg)



Cat. No. 700-HN153

Wire Size: 2 x 2.5 mm²
Single Wire – Up to #12 AWG
Double Wire – 2 x 2.5 mm² (#2–14 AWG… #2–20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in.) – Torque: 0.8 N•m (7 lb.-in.)

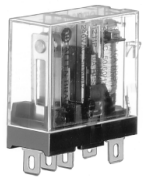


Cat. No. 700-HN154

Wire Size: 2 x 2.5 mm²
Single Wire – Up to #12 AWG
Double Wire – 2 x 2.5 mm² (#2–14 AWG… #2–20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in.) – Torque: 0.8 N•m (7 lb.-in.)

Interposing/Isolation Relays

Overview/Product Selection



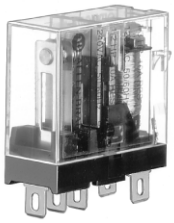
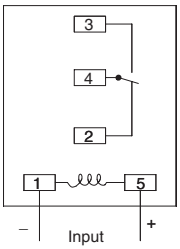
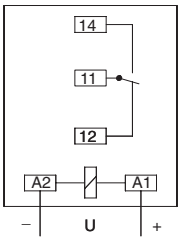
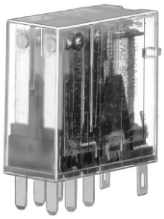
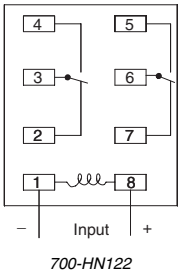
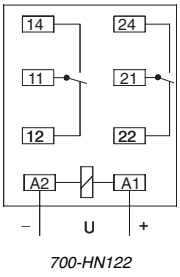
Bulletin 700-HK "Slim Line" Relay

- 5 A/10 A Contact Ratings
- DPDT/SPDT
- Plug-in Blade Style Terminals
- Built-in Retainer Clip in Sockets
- Choice of Standard Silver Cadmium Contacts, or Silver With Gold Flashed Contacts
- Options: LED

Table Of Contents

Product Selection 98
Accessories 99
Specifications 100
Approximate Dimensions 101

Slim Line Relay with Plug-in Quick Connect Terminations

	Description	Contact Rating	Wiring Diagrams U.S./Canada	Wiring Diagrams International	Coil Voltage	Cat. No. ❶ ❷	Factory-stocked Item ❸	Factory-stocked Item ❹
 *Bulletin 700-HK SPDT*	SPDT 1-Pole 1 Form C AgCdO Contacts	10 A	 *700-HN121*	 *700-HN121*	6V AC	700-HK36A06		
					12V AC	700-HK36A12	✔	
					24V AC	700-HK36A24 ❺	✔	✔
					120V AC	700-HK36A1 ❺	✔	✔
					240V AC	700-HK36A2	✔	
					6V DC	700-HK36Z06		
					12V DC	700-HK36Z12	✔	
					24V DC	700-HK36Z24 ❺	✔	✔
					48V DC	700-HK36Z48	✔	
	Socket				110V DC	700-HK36Z1	✔	
 *Bulletin 700-HK DPDT*	DPDT 2-Pole 2 Form C AgCdO Contacts	5 A	 *700-HN122*	 *700-HN122*	6V AC	700-HK32A06		
					12V AC	700-HK32A12		
					24V AC	700-HK32A24 ❺	✔	
					120V AC	700-HK32A1 ❺	✔	
					240V AC	700-HK32A2	✔	
					6V DC	700-HK32Z06		
					12V DC	700-HK32Z12	✔	
					24V DC	700-HK32Z24 ❺	✔	
					48V DC	700-HK32Z48	✔	
	Socket				110V DC	700-HK32Z1		

❶ LED Option: Add suffix (**-4**) to the selected Bulletin 700-HK relay Cat. No. except for the 240V AC units, add (**-4L**).
❷ For AgCdO Contact with Gold Overlay: Replace "3" with "X" in Cat. No. For example, if Cat. No. 700-HK36A1 is required with Gold Overlay, the new catalog number is 700-HKX6A1.
❸ Single Pack
❹ Bulk Pack
❺ Bulk Package Option: Relay can be purchased at discounted prices in bulk quantities of 100. Add suffix (**-99**) to the selected relay Catalog Number. The following relays are also available in the Bulk Package Option: Cat. Nos. 700-HK32A1-4, 700-HK32Z24-4, 700-HK36A1-4, and 700-HK36Z24-4.

	Description	Pkg. Qty.	Cat. No.	Factory-stocked Item
Cat. No. 700-HN121	**Screw Terminal Socket – Panel or DIN Rail Mounting** 5-blade miniature socket for use with 1-pole, Bulletin 700-HK relays. This socket includes a retainer clip. Order must be for 10 sockets or multiples of 10.	10	700-HN121	✔
Cat. No. 700-HN122	**Screw Terminal Socket – Panel or DIN Rail Mounting** 8-blade miniature socket for use with 2-pole, Bulletin 700-HK relays. This socket includes a retainer clip. Order must be for 10 sockets or multiples of 10.	10	700-HN122	✔
Cat. No. 199-DR1	**DIN Rail Mounting Pack** Standard 35 x 7.5 mm DIN Rail, 1 meter long, 10 rails per package. Order must be for 10 rails or multiples of 10.	10	199-DR1	✔

Bulletin 700-HK Slim Line Relay, Socket, and Retainer Clip Reference Chart

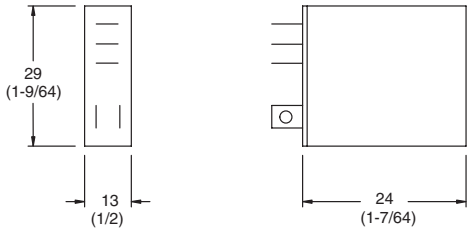
Relay Type	Socket Cat. No.	Retainer Clip Cat. No.
700-HK32	700-HN122	Provided
700-HK36	700-HN121	Provided

Specifications ❶

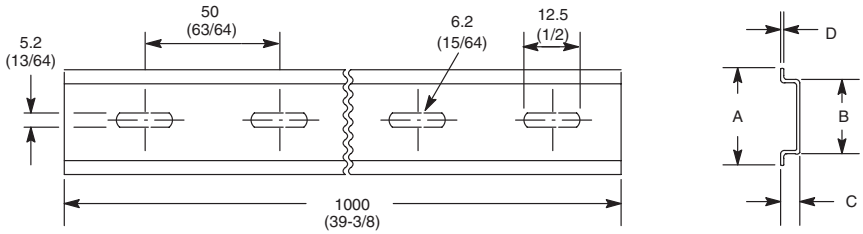
		Cat. No. 700-HK…						
Electrical Ratings								
Pilot Duty Rating ❷		B300						
Rated Thermal Current (I_{th})		1-Pole — 10 A			2-Pole — 5 A			
Rated Insulation Voltage (U_i)		250V IEC, 300V UL/CSA						
Contacts	Inductive	1-Pole		Hp	2-Pole		Hp	
	120V AC, 1-phase 240V AC, 1-phase	►][◄ 30 A 15 A	◄][► 3 A 1.5 A	1/3 1/2	►][◄ 30 A 15 A	◄][► 3 A 1.5 A	1/6 1/3	
	Make, Break, & Continuous V DC	30V, 10 A			30V, 5 A			
Min. Permissible Contact Ratings		700-HK = 500 mW, 700-HKX = 50 mW						
Permissible Coil Voltage Variation		80…110% of Nominal Voltage at 50 Hz 85…110% of Nominal Voltage at 60 Hz 80…110% of Nominal Voltage at DC						
Sealed Power Consumption ±10% AC Coils		Max. Allowable Leakage OFF 25% of VA❸ 1.1 VA 50 Hz 0.9 VA 60 Hz						
DC Coils		Max. Allowable Leakage of 10% of W 0.53 W						
Design Specification/Test Requirements								
Dielectric Withstand Voltage	Pole to Pole (VRMS)	1500V AC						
	Contact to Coil (VRMS)	1500V AC						
Mechanical								
Degree of Protection		Open Type (Sockets)						
Mechanical Life Operations		5×10^6						
Switching Frequency Operations		1800/hr.						
Coil Voltages		See Overview/Product Selection						
Operating Time at Nominal Voltage at 20°C (ms)	Pickup Dropout	15 15						
Maximum Operating Rate		3 Ops/s						
Vibration	Mechanical Malfunction	10…55 Hz, 1.50 mm (0.6 in.) double amplitude 10…55 Hz, 1.50 mm (0.6 in.) double amplitude						
Shock	Mechanical Malfunction	100 G 20 G (energized) 10 G (de-energized)						
Max. Socket Torque		0.8 Nm (7 lb. - in.)						
Environmental								
Temperature	Operating	–30…+55°C (–22…+131°F)						
	Storage	–5…+85°C (–67…+185°F)						
Altitude		2000 m (6560 ft)						
Construction								
Insulating Material		Molded High Dielectric Material						
Enclosure		Transparent Dust Cover						
Contact Material		Silver Cad. Ox., (AgCdO), Silver Cad. + Gold (AgCd + Au)						
Terminal Markings on Socket		In accordance with EN50 0005						
Sockets		**1-Pole**			**2-Pole**			
		700-HN121			700-HN122			
Approvals								
Certifications		CSA Certified, File LR75088, UL Recognized, File E3125, Guide NLDX 2,UL Listed, with Allen-Bradley socket, CE Marked (per EU Low Voltage Directive 73/23 EEC 93/68 EEC)						
Standards		IEC 255-1-00, IEC 255-23, CSA 22.2, UL 508						

❶ Performance Data – See page Important-2, publication A113.
❷ NEMA Rating Chart is on page 19.
❸ The inrush VA equals 1.5 times the sealed VA.

Approximate Dimensions are shown in millimeters (inches). Approximate Dimensions are not intended to be used for manufacturing purposes.

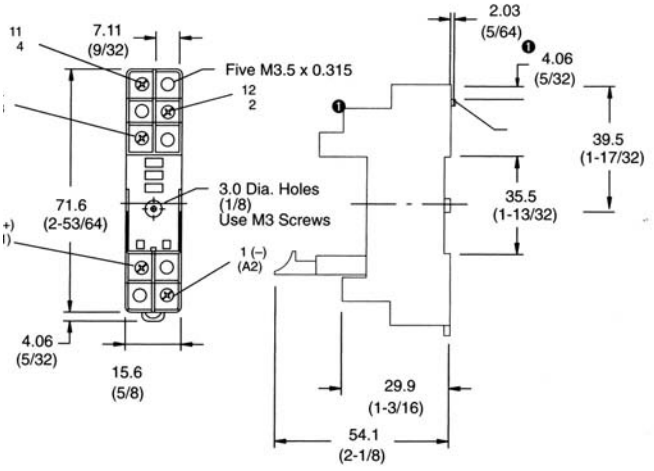


Bulletin 700-HK Relay
SPDT and DPDT Relays



Cat. No. 199-DR1 DIN Mounting Rail Series B
Cat. No. 199-DR4 DIN Mounting Rail Series B Has No Mounting Holes

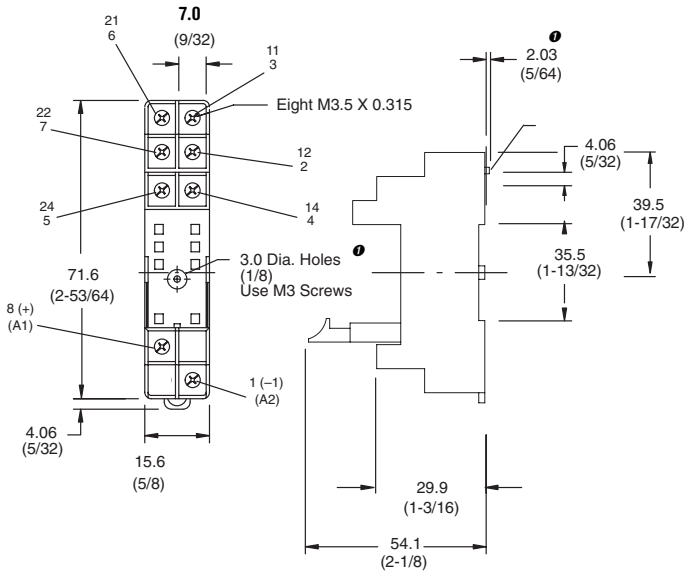
Cat. No.	A	B	C	D	Approx. Shipping Wt.
199-DR1	35 (1-3/8)	27 (1-1/16)	7.5 (19/64)	1.02 (1/64)	1.85 kg (4.07 lbs.) (10/pkg)
199-DR4	35 (1-3/8)	27 (1-1/16)	15 (19/32)	2.3 (3/32)	3.68 kg (8 lbs.) (5/pkg)



Cat. No. 700-HN121

Wire Size: 2 x 2.5 mm²
Single Wire – Up to #14 AWG
Double Wire – 2 x 2.5 mm² (#2–14 AWG… #2–20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in.) – Torque: 0.8 N•m (7 lb.-in.)

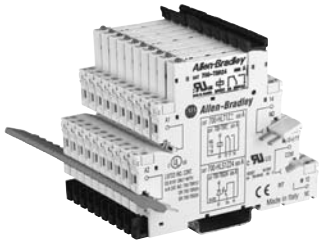
❶ Holes required for mounting [3 mm (1/8 in.) diameter].



Cat. No. 700-HN122

Wire Size: 2 x 2.5 mm²
Single Wire – Up to #14 AWG
Double Wire – 2 x 2.5 mm² (#2–14 AWG… #2–20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in.) – Torque: 0.8 N•m (7 lb.-in.)

❶ Holes required for mounting [3 mm (1/8 in.) diameter].

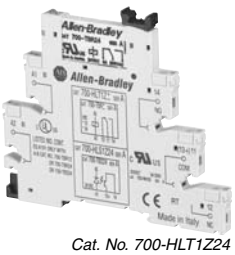
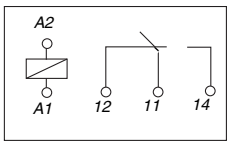
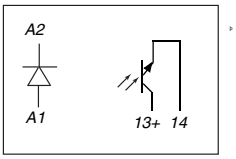


Bulletin 700-HL "Terminal Block Relay"

- Relay and Socket Assembled Interface Modules For High Density Interposing or Isolation Applications
- Screw Terminal Socket
- 6 A Relay, Choice of Silver or Gold Contacts
- 2 A Solid-State Load
- SPDT (Relay) , 1 N.O. (Solid-State)
- Built-in Retainer Clip and Snap-in Marker Lever
- Standard LED, Reverse Polarity Protection, and Surge Protection
- Externally Replaceable Relay Modules
- Unique Leakage Current Suppression Version to Address Industry Concerns of Nuisance Coil Turn-on or Contact Non-Drop Out when Connecting to PLCs with Leakage Current

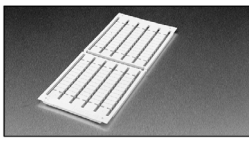
Table Of Contents

Product Selection 102
Accessories 103
Specifications 104
Approximate Dimensions 106

Standard built-in Features: • LED • Reverse Polarity Protection for DC Inputs • Coil Surge Protection	 *Cat. No. 700-HLT1Z24*	 *Cat. No. 700-HLS1Z24*
Specifications		
Output Type	SPDT (1 C/O); I_{th} = 6A ❸	1 N.O. solid-state; I_{th} = 2 A, 24V DC
Recommended Tightening Torque	0.5 Nm max. (4.4 lb.–in.)	
Wire Range	Screw Terminal: 0.14 mm²…2.5 mm² (#26…#14 AWG)	
Certifications	cULus, cURus, ABS, CE, IMQ	

Assembled Devices	Cat. No. (Screw Terminals)	Pkg Qty.	Factory-stocked Item	Cat. No. ❶ (Screw Terminals)	Pkg Qty.	Factory-stocked Item
Input Voltages						
12V DC	700-HLT1Z12 ❷	10	✔	—	–	
24V DC	700-HLT1Z24 ❷	10	✔	700-HLS1Z24 ❷	10	✔
48V DC	700-HLT1Z48 ❷	10		700-HLS1Z48 ❷	10	
12V AC/DC	700-HLT1U12	10		—	—	
24V AC/DC	700-HLT1U24	10	✔	—	—	
48V AC/DC	700-HLT1U48	10		—	—	
110/125V AC/DC	700-HLT1U1	10	✔	700-HLS1U1 ❷	10	✔
220-240V AC/DC	700-HLT1U2	10	✔	700-HLS1U2 ❷	10	✔
Built-in LCSC (leakage current suppression circuit) 120V AC and 125V DC	700-HLT1L1 ❷	10	✔	700-HLS1L1 ❷	10	✔
Built-in LCSC (leakage current suppression circuit) 240V AC	700-HLT1L2 ❷	10	✔	700-HLS1L2 ❷	10	4

❶ Reverse polarity on the output terminals of the solid-state relay will result in the output being "ON" regardless of the state of the input voltage.
❷ Electromechanical relay to solid-state relay interchangeability is possible.
❸ For Gold-plated contacts: Add the letter “X” at the end of the catalog number. For example: if Cat. No. 700-HLT1Z24 is required with gold plating, the new cat. no. is 700-HLT1Z24X.

	Description	Pkg. Qty.	Socket Input Voltage	Cat. No.	Factory-stocked Item
Cat. No. 700-TBR24	**Replacement Relays** Order must be for 20 relays or multiples of 20.	20	12V	700-TBR12 ❶	✔
			24V	700-TBR24 ❶	✔
			48V	700-TBR48 ❶	✔
			110/125V	700-TBR60 ❶	✔
			220…240V		
			120V…125V		
			240V		
Cat. No. 700-TBS24	**Replacement SSR** 4-blade miniature relay for use with 1 N.O. SSR output. Order must be for 18 relays or multiples of 18.	18	24V	700-TBS24	✔
			48V	700-TBS60	✔
			110/125V		
			220…240V		
			120V…125V		
			240V		
			120/125V		
Cat. No. 700-TBJ20B	**20-Way Jumper** Can be cut to required length. I_{th} =36 A max per 20-way jumper.	1	Color		
			Red	700-TBJ20R	✔
			Gray	700-TBJ20G	✔
			Blue	700-TBJ20B	✔
Cat. No. 700-HN177	**End Barrier** Used for visual inspection of groups, safe separation of neighboring 700-HL modules that end with jumpers. Order must be for 10 or multiples of 10.	10	Black	700-HN177	✔
	**Snap-in Marker** These snap-in markers have a 6 x 10 mm surface and snap into the ejection lever for the relay.	100	Blank	1492-SMN81	
			Standard 1492-SMN81	See publication A113, page 12-189	
			Custom	❷	

❶ For gold-plated contacts: Add the letter “X” at the end of the catalog number. For example: if Cat. No. 700-TBR24 is required with gold plating, the new cat. no. is 700-TBR24X.
❷ Go to http://www.ab.com/software/termblock/index.html and download software. Create custom text, save file, and e-mail to your local Allen-Bradley distributor.

Specifications ❶

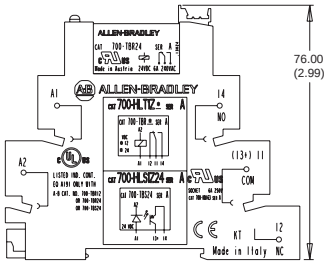
Cat. No. 700-HLT… (Relay Output)							
Electrical Ratings							
Pilot Duty Rating	6 A NEMA B 300, R 300						
Rated Thermal Current (I_{th})	1-Pole — 6 A						
Rated Insulation Voltage (U_i)	250V IEC, 300V UL/CSA						
Contacts	Inductive	1-Pole					
	24V AC, 1-phase	30 A ►][◄	5 A ◄][►				
	120V AC, 1-phase	30 A	3 A				
	240V AC, 1-phase	15 A	1.5 A				
	Make, Break, & Continuous V DC	24V DC 120V DC 240V DC	1.0 A 0.2 A 0.1 A				
Min. Permissible Contact Ratings	12V, 6 mA (72 mW) for Silver Contacts, 8V, 2.5 mA (20 mW) for Gold Contacts						
Permissible Coil Voltage Variation	85…110% of Nominal Voltage at 50 Hz 85…110% of Nominal Voltage at 60 Hz 80…110% of Nominal Voltage at DC						
Power Consumption ±10%	AC	0.3 VA					
	DC	0.2 W					
Design Specification/Test Requirements							
Dielectric Withstand Voltage	Pole to Pole (VRMS)	1500 VA					
	Contact to Coil (VRMS)	4000 VA					
Input Voltage	12V AC/DC	24V AC/DC	48V AC/DC	120V AC/DC	240V AC/DC	120V LCSC	240V LCSC
Impedance (Ohms)	1 K	2 K	6 K	26 K	56 K	16 K	35 K
Mechanical							
Degree of Protection	IP20						
Mechanical Life Operations	1 x 10^7						
Electrical Life Operations	6 A Resistive: 100,000 min. 24V DC, 1 A Inductive: 200, 000 min. 120V AC 1 A Inductive: 300,000 min.						
Switching Frequency Operations (no-load)	10 cycles/sec						
Coil Voltages	See Overview/Product Selection						
Operating Time at Nominal Voltage at 20°C (ms)	Pickup Dropout	7 ms 3 ms					
Maximum Operating Rate (full load = 6 A)	6 cycles/min.						
Coil Surge Protection	Per EN 61000-4.5; Surge Immunity (801-5) Class III: 2 kV common and 1 kV differential mode						
Environmental							
Temperature	Operating	–40…+55°C					
	Storage	-40…100°C					
Altitude	2000 m (6560 ft)						
Construction							
Insulating Material	Molded High Dielectric Material						
Enclosure	Relay IP67						
Contact Material	Silver Tin Ox., AgSnO or Silver with Gold Plating, AgSnO + Au						
Terminal Markings on Socket	In accordance with EN50 0005						
Certifications	cURus Recognized, File E3125,Guide NLDX 2,cULus Listed, with Allen-Bradley socket, CE Marked (per EU Low Voltage Directive 73/23 EEC 93/68 EEC), ABS (American Bureau of Shipping)						
Standards	EN60947-4-1,EN60947-5-1,IEC 947CSA 22.2,UL 508,NEMA IEE MAC Compliant, ICS-2 Compliant						

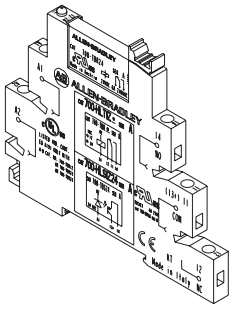
❶ Performance Data – See page Important-2, publication A113.

Cat. No. 700-HLS… (Solid State Output)						
Electrical						
Rated Thermal Current (I_{th})	2 A					
Rated Insulation Voltage (U_i)	250V IEC, 300V UL/CSA					
Control Circuit	Min. Control Voltage	80% nominal voltage				
	Maximum Control Voltage	110% nominal voltage				
	Control Current	9 mA ±10% (24V) 4 mA ±10% (120/240V)				
	Release Voltage	0.4 x nominal voltage (24V), 0.35 x nominal voltage (120/240V)				
	Min. Control Circuit Resistance	3200 ohms (24V), 16k ohms (120V), 32k ohms (240V)				
Outputs	Load Voltage Range	0…24V DC				
	Max. Repetitive Blocking Voltage	33V				
	Max. Switching Current	2 A DC				
	On State Voltage Drop @ Max. Switching Current	< 120 mV DC				
	Leakage Current	max. 100 µA (@U = 24V)				
Power Consumption ±10%	AC	0.3 VA				
	DC	0.2 W				
Design Specification/Test Requirements						
Dielectric Withstand Voltage	Pole to Pole (VRMS)	2500 VA				
	Contact to Coil (VRMS)	2500 VA				
Input Voltage	24V DC	48V DC	120V AC/DC	240V AC/DC	120V LCSC	240V LCSC
Impedance (Ohms)	2K	9 K	26 K	58 K	16 K	35 K
Mechanical						
Degree of Protection	IP20					
Input Voltages	See Overview/Product Selection					
Operating Time at Nominal Voltage at 20°C (ms)	Turn on Time	30 µs (DC only input voltage), 7 ms (AC/DC input voltage)				
	Drop Off Time	350 µs (DC only input voltage), 10 ms (AC/DC input voltage)				
Maximum Operating Rate	300 Hz					
Environmental						
Temperature	Operating	–20…+55°C				
	Storage	-40…70°C				
Altitude	2000 m (6560 ft)					
Construction						
Insulating Material	Molded High Dielectric Material					
Enclosure	Relay IP67					
Terminal Markings on Socket	In accordance with EN50 0005					
Certifications	cULus, cURus, ABS, CE					

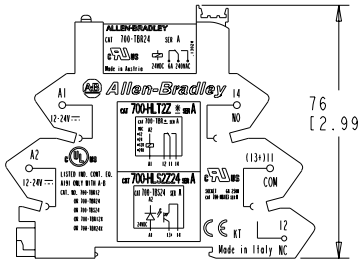
Approximate Dimensions

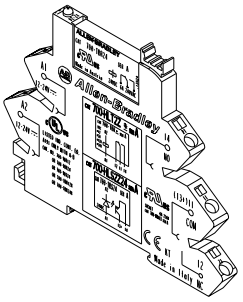
Approximate Dimensions are shown in millimeters (inches). Approximate Dimensions are not intended to be used for manufacturing purposes.

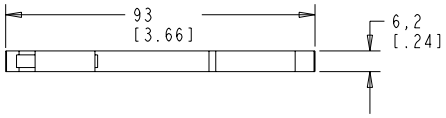




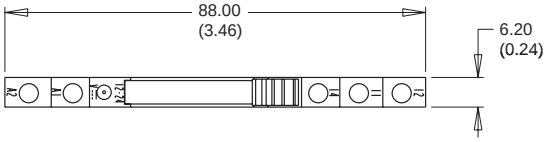
Bulletin 700-HL Screw Terminal Design

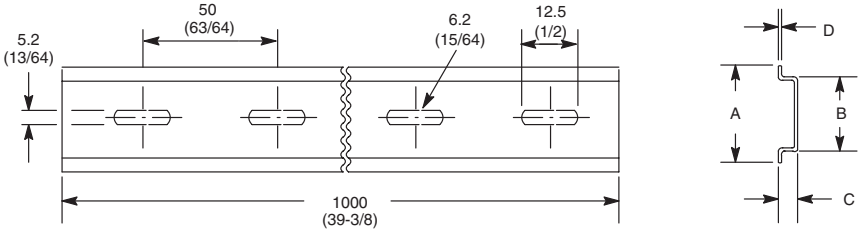






Bulletin 700-HL Spring Terminal Design





Cat. No. 199-DR1 DIN Mounting Rail Series B
Cat. No. 199-DR4 DIN Mounting Rail Series B Has No Mounting Holes

Cat. No.	A	B	C	D	Approx. Shipping Wt.
199-DR1	35 (1-3/8)	27 (1-1/16)	7.5 (19/64)	1.02 (1/64)	1.85 kg (4.07 lbs.) (10/pkg)
199-DR4	35 (1-3/8)	27 (1-1/16)	15 (19/32)	2.3 (3/32)	3.68 kg (8 lbs.) (5/pkg)

Bulletin 700-HP (PCB) "Pin Style" Relay

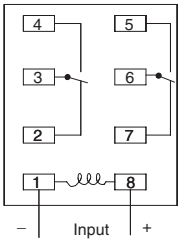
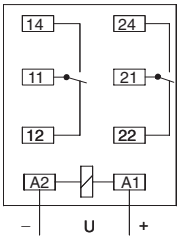
- 8 A Contact Ratings
- DPDT/ (2 c/o) Contacts
- Plug-in PIN Style (PCB) Terminals (5 mm Pinning)
- Choice of Standard Silver Nickel Contacts, or Silver with Gold Plated Contacts
- Options: None

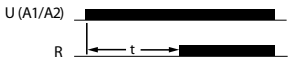
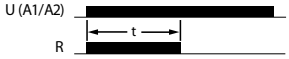
Table Of Contents

Product Selection **107**
Accessories **108**
Specifications **109**
Approximate Dimensions **110**

Slim Line Relay with Plug-in Quick Connect Terminations

Bulletin 700-HP DPDT

Description	Contact Rating	Wiring Diagrams		Coil Voltage	Cat. No.	Factory-stocked Item
		U.S./Canada	International			
SPDT 2-Pole 2 Form C AgNi + Au Gold Plated Contacts Socket	8 A	 *700-HN123*	 *700-HN123*	6V AC	700-HPX2A06	
				12V AC	700-HPX2A12	✔
				24V AC	700-HPX2A24	✔
				120V AC	700-HPX2A1	✔
				240V AC	700-HPX2A2	✔
				6V DC	700-HPX2Z06	
				12V DC	700-HPX2Z12	✔
				24V DC	700-HPX2Z24	✔
				48V DC	700-HPX2Z48	
				110V DC	700-HPX2Z1	
DPDT 2-Pole 2 Form C AgNi Contacts Socket				6V AC	700-HP32A06	
				12V AC	700-HP32A12	
				24V AC	700-HP32A24	✔
				120V AC	700-HP32A1	✔
				240V AC	700-HP32A2	✔
				6V DC	700-HP32Z06	✔
				12V DC	700-HP32Z12	✔
				24V DC	700-HP32Z24	✔
				48V DC	700-HP32Z48	
				110V DC	700-HP32Z1	

	Description	Pkg. Qty.	Cat. No.	Factory-stocked Item
	Diode with LED Surge Suppressor Voltage Range: 6…24V DC used with 700-HN123 socket	10	700-ADL1R	✔
	Diode with LED Surge Suppressor Voltage Range: 28…60V DC used with 700-HN123 socket	10	700-ADL2R	✔
	Diode with LED Surge Suppressor Voltage Range: 110…220V DC used with 700-HN123 socket	10	700-ADL3R	✔
	Varistor with LED Surge Suppressor Used with 700-HN153 Socket Voltage Range: 6…24V AC used with 700-HN123 socket	10	700-AV1R	✔
	Varistor with LED Surge Suppressor Used with 700-HN153 Socket Voltage Range: 110…240V AC used with 700-HN123 socket	10	700-AV3R	✔
	RC Surge Suppressor Voltage Range: 6…24V AC/DC used with 700-HN123 socket	10	700-AR1	✔
	RC Surge Suppressor Voltage Range: 110…240V AC/DC used with 700-HN123 socket	10	700-AR2	✔
 Cat. No. 700-AT2	**ON-Delay Time Module** Voltage Range: 12…24V AC/DC used with 700-HN104 socket 	1	700-AT1	available Oct. 02’
	One Shot Timing Module Voltage Range: 12…24V AC/DC used with 700-HN153 socket 	1	700-AT2	available Oct. 02’
 Cat. No. 700-HN123	**Screw Terminal Socket – Panel or DIN Rail Mounting** 8-pin miniature socket for use with 2-pole, Bulletin 700-HP relays. Incorporates coil and contact separation. Order must be for 10 sockets or multiples of 10.	10	700-HN123	✔
 Cat. No. 199-DR1	**DIN Rail Mounting Pack** Standard 35 x 7.5 mm DIN Rail, 1 meter long, 10 rails per package. Order must be for 10 rails or multiples of 10.	10	199-DR1	✔
	Plastic Retainer and Ejection Lever For use with the 700-HN123 Sockets Built-in ability to accept 1492 Snap-in Markers Order must be in multiples of 10	10	700-HN119	✔

Bulletin 700-HP Pin Style (PCB) Slim Line Relay, Socket, and Retainer Clip Reference Chart

Relay Type	Socket Cat. No.	Retainer Clip Cat. No.
700-HPX2	700-HN123	700-HN119
700-HP32	700-HN123	700-HN119

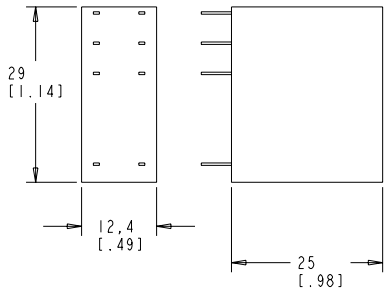
		Cat. No. 700-HP…			
Electrical Ratings					
Pilot Duty Rating ❷		C300, R300			
Rated Thermal Current (I_{th})		2-Pole — 8A			
Rated Insulation Voltage (U_i)		250V IEC, 300V UL/CSA			
Contacts	Inductive	2-Pole			Hp
	120V AC, 1-phase 240V AC, 1-phase	►][◄ 15 A 7.5 A	◄][► 1.5 A 0.75 A		1/6 1/3
	Make, Break, & Continuous V DC	30V, 8 A			
Min. Permissible Contact Ratings		700-HP32 = 300 mW (5V, 5 mA) 700-HPX = 50 mW (5V, 5 mA)			
Permissible Coil Voltage Variation		80…110% of Nominal Voltage at 50 Hz 80…110% of Nominal Voltage at 60 Hz 73…150% of Nominal Voltage at DC		Drop-out: Voltage:	20% of Nominal Coil Voltage AC 10% of Nominal Coil Voltage DC
Sealed Power Consumption ±10% AC Coils		Max. Allowable Leakage OFF 25% of VA❸ 1.2 VA 50 Hz 1.0 VA 60 Hz			
DC Coils		Max. Allowable Leakage of 10% of W 0.5 W			
Design Specification/Test Requirements					
Dielectric Withstand Voltage for One Minute	Pole to Pole (VRMS)	2000V AC			
	Contact to Coil (VRMS)	5000V AC			
Mechanical					
Degree of Protection		Open Type (Sockets)			
Mechanical Life Operations		10 x 10^6 (AC Coils), 20 x 10^6 (DC coils)			
Switching Frequency Operations		1800/hr.			
Coil Voltages		See Overview/Product Selection			
Operating Time at Nominal Voltage at 20°C (ms)	Pickup Dropout	15 12			
Maximum Operating Rate		16 Ops/s			
Vibration	Enclosure Fragility	5 G 2.5 G			
Shock	Endurance Fragility	50 G 15 G			
Max. Socket Torque		0.5 Nm (4.4 lb. - in.)			
Environmental					
Temperature	Operating	–40…+85°C			
	Storage	–45…+100°C			
Altitude		2000 m (6560 ft)			
Construction					
Insulating Material		Molded High Dielectric Material			
Enclosure		Transparent Dust Cover			
Contact Material		Silver Nickel, (AgNi), Silver Nickel + Gold Plating (AgNi + Au)			
Terminal Markings on Socket		In accordance with EN50 0005			
Sockets		**2-Pole**			
		700-HN123			
Approvals					
Certifications		CSA Certified, File LR75088, UL Recognized, File E3125, Guide NLDX 2,UL Listed, with Allen-Bradley socket, CE Marked (per EU Low Voltage Directive 73/23 EEC 93/68 EEC)			
Standards		IEC 255-1-00, IEC 255-23, CSA 22.2, UL 508			

❶ Performance Data – See page Important-2, publication A113.
❷ NEMA Rating Chart is on page 19.
❸ The inrush VA equals 1.5 times the sealed VA.

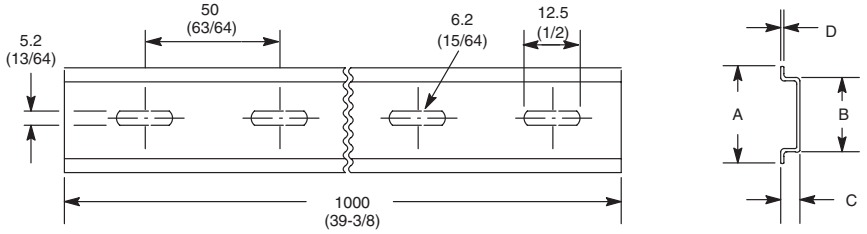
Interposing/Isolation Relays

Approximate Dimensions

Approximate Dimensions are shown in millimeters (inches). Approximate Dimensions are not intended to be used for manufacturing purposes.

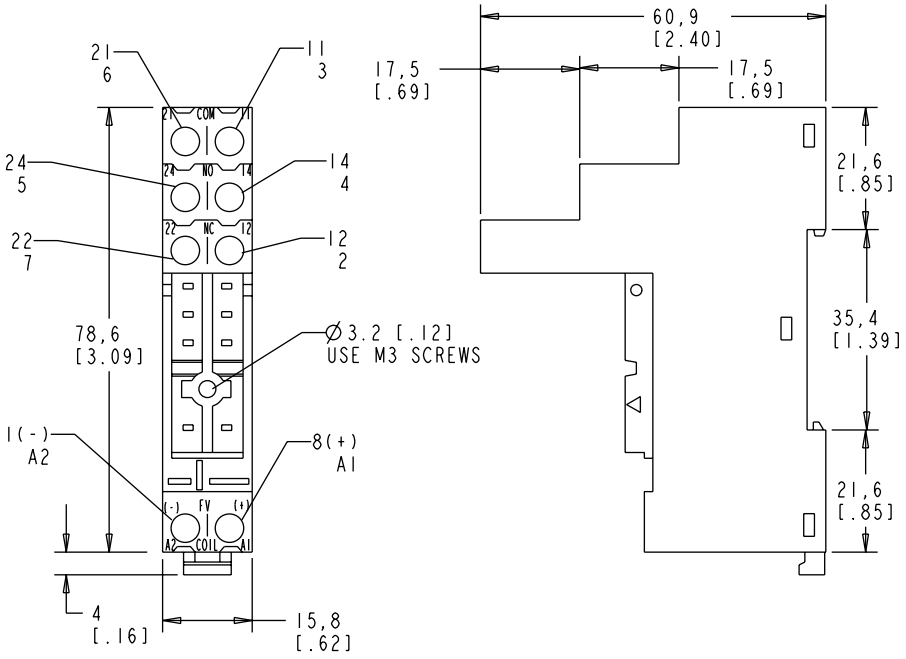


Bulletin 700-HP Relay



Cat. No. 199-DR1 DIN Mounting Rail Series B
Cat. No. 199-DR4 DIN Mounting Rail Series B Has No Mounting Holes

Cat. No.	A	B	C	D	Approx. Shipping Wt.
199-DR1	35 (1-3/8)	27 (1-1/16)	7.5 (19/64)	1.02 (1/64)	1.85 kg (4.07 lbs.) (10/pkg)
199-DR4	35 (1-3/8)	27 (1-1/16)	15 (19/32)	2.3 (3/32)	3.68 kg (8 lbs.) (5/pkg)



Cat. No. 700-HN123

Single Wire: 0.2 mm2.....2.5 mm2 (#24 AWG.....14 AWG)
Double Wire: 2 X 0.2 mm2.....2 X 2.5 mm2 (2 X 24 AWG....#.2 X 14 AWG)
Wire Type: solid or stranded, copper only
Strip Length: 7 mm (9/32 in.), Torque: 0.5Nm (4.4 lb-in.)

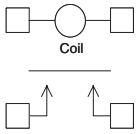
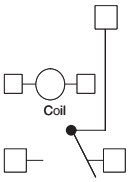
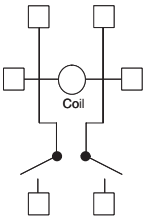
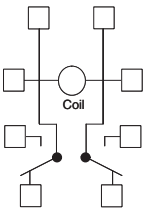
Bulletin 700-HG "Power" Relay

- 30 A Contact Ratings
- SPST-NO-DM, SPDT, DPST-NO, DPDT
- Panel Mounted
- Options: Magnetic Blowout for High DC Loads, Auxiliary Snap Action Switch

Table Of Contents

Product Selection 111
Accessories 112
Specifications 113
Approximate Dimensions 113

Power Relay with Screw Terminals #6-32 for Coil, #8-32 for Contacts

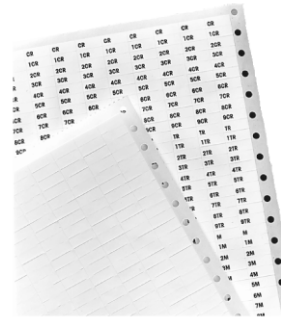
	Description	Contact Ratings	Wiring Diagrams	Coil Voltage	Cat. No. ❶❷	Factory-stocked Item ❹
SPST-NO-DM	SPST-NO-DM 1 Form X AgCdO Contacts	30 A (A600)		24V AC	700-HG45A24	✔
				120V AC	700-HG45A1	✔
				240V AC	700-HG45A2 ❸	✔
				277V AC	700-HG45A27	
				480V AC	700-HG45A4	✔
				12V DC	700-HG45Z12	✔
				24V DC	700-HG45Z24	✔
				48V DC	700-HG45Z48	
				110V DC	700-HG45Z1	
SPDT	SPDT 1-pole 1 Form C AgCdO Contacts	30 A (A600)		24V AC	700-HG46A24	
				120V AC	700-HG46A1	✔
				240V AC	700-HG46A2	
				12V DC	700-HG46Z12	
				24V DC	700-HG46Z24	✔
				48V DC	700-HG46Z48	
				110V DC	700-HG46Z1	
DPST-NO	DPST-NO 2-pole 2 Form A AgCdO Contacts	30 A (A600)		24V AC	700-HG47A24	
				120V AC	700-HG47A1 ❸	✔
				240V AC	700-HG47A2	✔
				480V AC	700-HG47A4	
				12V DC	700-HG47Z12	
				24V DC	700-HG47Z24	✔
				48V DC	700-HG47Z48	
				110V DC	700-HG47Z1	
DPDT	DPDT 2-pole 2 Form C AgCdO Contacts	30 A (A600)		24V AC	700-HG42A24	✔
				120V AC	700-HG42A1 ❸	✔
				240V AC	700-HG42A2 ❸	✔
				277 AC	700-HG42A27	✔
				12V DC	700-HG42Z12	
				24V DC	700-HG42Z24	✔
				48V DC	700-HG42Z48	
				110V DC	700-HG42Z1	
				220V DC	700-HG42Z2	
				250V DC	700-HG42Z25	

❶ Auxiliary Snap Switch Option: Add suffix (**-5**) to the selected Bulletin 700-HG relay Cat. No, except for the 220V DC add (-5L).
❷ Magnetic Blowout Option: Add suffix (**-6**) to the selected Bulletin 700-HG relay Cat. No. (suppresses the arc when switching DC loads – ratings listed below).
❸ Bulk Package Option: Relay can be purchased at discounted prices in bulk quantities of 36 (Cat. No. 700-HG42…) or 45 (Cat. Nos. 700-HG45… and 700-HG47…). Add suffix (**-99**) to the selected relay Catalog Number.
❹ Single Pack

Auxiliary Snap Action Switch

Contact	Material	Rating	Dielectric Withstand V (1 Min.)
SPDT (1 Form C)	Silver Cad. Ox.	10 A at 120 or 240 Resistive	1500V AC RMS Contact to Frame

Accessories

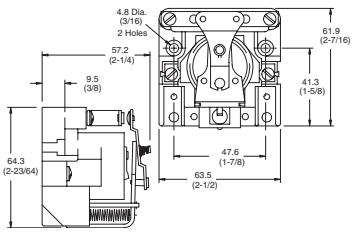
	Description	Pkg. Qty.	Cat. No.	Factory-stocked Item
	**Pre-printed identification tags –** contains 10 sheets of pre-printed and blank tags. Each sheet contains 13 sets of the markings CR…9CR, TR…9TR, M…9M, F, R, 1S, and 117 blank tags. Tags are peel-off with sticky backing for easy placement on relays.	10	700-N40	
	Blank identification tags – contains 10 sheets of blank identification tags for customer specialized printing. Each sheet contains 546 blank tags. Tags are peel-off with sticky backing for easy placement on relays.	10	700-N41	

Cat. No. 700-HG…												
Electrical Ratings												
Pilot Duty Rating ❷	A600											
Rated Thermal Current (I_{th})	30 A											
Rated Insulation Voltage (U_i)	600V UL											
Contact Ratings: AC Ratings SPST-NO-DM						**Contact Ratings:** AC Ratings SPDT, DPST – NO and DPDT						
Volts	Inductive			Resistive – Make/Break and Continuous	Hp	Volts	Inductive			Resistive – Make/Break and Continuous	Hp ❸	
	Make	Break	Continuous				Make	Break	Continuous			
120 240	60 A 30 A	6 A 3 A	10 A 10 A	30 A 30 A	2	120 240	60 A 30 A	6 A 3 A	10 A 10 A	30 A 30 A	1-1/2	
480 600	15 A 12 A	1.5 A 1.2 A	10 A 10 A	12 A 10 A	2	480 600	15 A 12 A	1.5 A 1.2 A	10 A 10 A	5 A 5 A	1-1/2	
DC Ratings: Without Magnetic Blowouts – 28V 30 A – Make, Break and Continuous						Est Drop 125V 1.5…3 A						
DC Ratings: With Magnetic Blowouts:		SPST – NO – DM		SPDT, DPST – NO and DPDT								
Make, Break and Continuous	110V 220V 325V 500V	20 A 8 A 4 A 2 A		10 A 4 A 2 A —								
Permissible Coil Voltage Variation	80…110% of Nominal Voltage at 50 Hz 85…110% of Nominal Voltage at 60 Hz 80…110% of Nominal Voltage at DC											
Coil Consumption ±10%	Inrush	**50 Hz**		**60 Hz**								
AC Coils	Sealed	13 VA 10 VA		16 VA 11 VA								
DC Coils	2.0 W											
Design Specification/Test Requirements												
Dielectric Withstand Voltage	Pole-to-Pole	2200V AC										
	Contact to Pole	2200V										
	Contact to Frame	2200V AC										
Mechanical												
Degree of Protection	Open Type											
Mechanical Life Operations	5×10^6											
Switching Frequency Operations	1600/Hr											
Coil Voltages	See Overview/Product Selection											
Operating Time at Nominal Voltage at 20°C	Pickup	40 ms										
	Dropout	35 ms										
Maximum Operating Rate	—											
Environmental												
Temperature	Operating	–30…+55°C (–22…+122°F)										
	Storage	–30…+65°C (–22…+149°F)										
Altitude	2000 m (6560 ft.)											
Construction												
Insulating Material	Molded Thermo Setting Plastic											
Enclosure	—											
Contact Material	Silver Cadmium Oxide											
Terminal Markings on Socket	—											
Sockets	N/A											
Certifications	CSA Certified, File LR70803, UL Listed, File E3125,Guide NLDX 2, CE Marked (per EU Low Voltage Directive 73/23 EEC 93/68 EEC)											
Standards	EN 60947-4-1, EN 60947-5-1, IEC 947,CSA 22.2,UL 508											

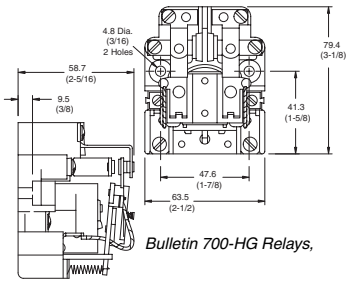
❶ Performance Data – See page Important-2, publication A113.
❷ NEMA Rating Chart is on page 19.
❸ For DPDT only: 2 Hp Switching 2 Poles, 200…600V AC, 50/60 Hz.

Approximate Dimensions

Approximate Dimensions are shown in millimeters (inches). Approximate Dimensions are not intended to be used for manufacturing purposes.



Bulletin 700-HG Relays, SPST-NO-DM,



Bulletin 700-HG Relays,

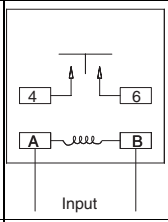
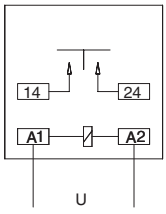
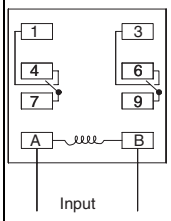
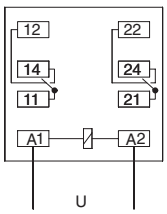
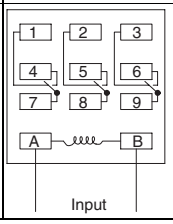
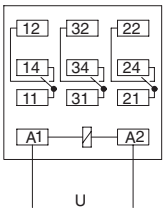
Bulletin 700-HHF

- Flange-Mounted
- Blade Style Quick Connect Terminals
- Optional Pilot Light
- Solder Terminals

Table Of Contents

Product Selection 114
Specifications 115
Approximate Dimensions 115

Flange-Mounted Power Relay with Blade Style 0.250 x 0.032" Quick Connect/Solder Terminations ❶

Description	Contact Ratings	Wiring Diagrams		Coil Voltage	Cat. No.	Factory-stocked Item ❷
		U.S./Canada	International			
SPST-NO-DM 1 Form X AgCdO Contacts	30 A (A600)			24V AC	700-HHF45A24	
				120V AC	700-HHF45A1	✔
				24V DC	700-HHF45Z24	✔
DPDT 2-Pole 2 Form C AgCdO Contacts	25 A (B600)			24V AC	700-HHF62A24	✔
				120V AC	700-HHF62A1	✔
				240V AC	700-HHF62A2	✔
				6V DC	700-HHF62Z06	
				12V DC	700-HHF62Z12	✔
				24V DC	700-HHF62Z24	✔
3PDT 3-Pole 3 Form C AgCdO Contacts	20 A (B300)			120V AC	700-HHF73A1	

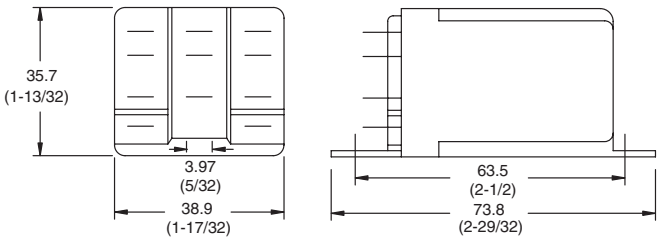
❶ LED Option: Add suffix **(-4)** to the selected Bulletin 700-HHF Relay Cat. No. except for the 240V AC units, add (**-4L**).
❷ Single Pack

		Cat. No. 700-HHF…								
Electrical Ratings										
Pilot Duty Rating ❷		SPST-NO-DM DPDT 3PDT	NEMA A600 NEMA B600 NEMA B300							
Rated Thermal Current (I_{th})		SPST-NO-DM 30 A, DPDT 25A, 3PDT 20 A								
Rated Insulation Voltage (U_i)		250V IEC-300V UL/CSA								
Contacts	Inductive	**SPST-NO-DM**		**Hp**	**DPDT**		**Hp**	**3PDT**		**Hp**
	120V AC 240V AC	►][◄ 60 A 30 A	◄][► 6 A 3.0 A	1 1-1/2	►][◄ 30 A 15 A	◄][► 3 A 1.5 A	1 1-1/2	►][◄ 30 A 15 A	◄][► 3 A 1.5 A	1/2 —
	DC	28V DC, 30 A			28V DC, 13 A			—		
Permissible Coil Voltage Variation		85…110% of Nominal Voltage at 50 Hz 85…110% of Nominal Voltage at 60 Hz 80…110% of Nominal Voltage at DC								
Coil Consumption ±10%		SPST-NO-DM			DPDT			3PDT		
	Inrush	**50 Hz**		**60 Hz**	**50 Hz**		**60 Hz**	**50 Hz**		**60 Hz**
AC Coils	Sealed	7.2 VA 4.8 VA		6.3 VA 4.2 VA	7.2 VA 4.8 VA		6.3 VA 4.2 VA	7.2 VA 4.8 VA		6.3 VA 4.2 VA
DC Coils		1.4 W								
Max. Allowable Leakage		25% of VA								
		10% of W								
Design Specification/Test Requirements										
Dielectric Withstand Voltage	Pole-to-Pole	2200V AC								
	Contact-to-Pole	2200V AC								
	Contact-to-Frame	1600V AC								
Mechanical										
Mechanical Life Operations		5 x 10^6								
Switching Frequency Operations		3600/Hr								
Coil Voltages		See Overview/Product Selection								
Operating Time at Nominal Voltage at 20°C	Pickup	20 ms								
	Dropout	15 ms								
Maximum Operating Rate		4 Ops/s.								
Environmental										
Temperature	Operating	–30…+50°C (–22…+122°F)								
	Storage	–30…+100°C (–22…+212°F)								
Altitude		2000 m (6560 ft)								
Construction										
Insulating Material		Molded High Dielectric Material								
Enclosure		Transparent Dust Cover								
Contact Material		Silver Cadmium Oxide								
Terminal Markings on Socket		In accordance with EN50 0005								
Sockets		❸								
Certifications		CSA Certified, LR70803,UL Recognized, File E3125,Guide NLDX 2, CE Marked (per EU Low Voltage Directive 73/23 EEC 93/68 EEC)								
Standards		EN 60947-4-1,EN 60947-5-1, IEC 947,CSA 22.2,UL 508								

❶ Performance Data – See page Important-2, publication A113.
❷ NEMA Rating Chart is on page 19.
❸ Bulletin 700-HHF relay wiring and terminals are the quick connect/solder type 6.35 x 0.82 mm (0.250 x 0.032") termination.

Approximate Dimensions

Approximate Dimensions are shown in millimeters (inches). Approximate Dimensions are not intended to be used for manufacturing purposes.



Bulletin 700-HHF Relays

Bulletin 700-FE

- Adjustable Function and Timing Range Timing Relays
- DIN Rail Mounted Without Cost of Socket
- 17.5 mm wide, Multi-Function or Single Function
- Available as 1 N.O. or SPDT Contact Output, 6A
- Timing Ranges From 0.05s…10.0h

Table Of Contents

Product Selection 117
Accessories 118
Specifications 118
Approximate Dimensions 119

Multi-Function

This device offers you the flexibility of selecting one of 4 single timing functions.

Functions Available	Contact Output	Time Ranges	Supply Voltages	Cat. No.	Factory-stocked Item
On-delay, Off-delay, One Shot, Flasher (repeat cycle starting with pulse)	1 N.O.	0.75 s…1 h (4 settings)❷	24V AC/DC ❶ 110…240V AC 50/60 Hz	700-FEM1RU22	✔
On-delay, Off-delay, One Shot, Flasher (repeat cycle starting with pulse)	SPDT (I C/O)	0.05 s…10 h (6 settings)❸	24V…48V AC/DC 24…240V AC 50/60 Hz	700-FEM3TU23	✔

Single-Function

This device offers you one specific timing function.

Functions Available	Contact Output	Time Ranges	Supply Voltages	Cat. No.	Factory-stocked Item
On-delay	1 N.O.	0.75 s…1 h (4 settings)❹	24V AC/DC❶ 110…240V AC 50/60 Hz	700-FEA1SU22	✔
	SPDT (1 C/O)	0.05S…10 h (6 settings)❸	24V…48V AC/DC 24…240V AC 50/60 Hz	700-FEA3TU23	✔
Off-delay	1 N.O.	0.75 s…1 h (4 settings)❹	24V AC/DC❶ 110…240V AC 50/60 Hz	700-FEB1SU22	✔
	SPDT (1 C/O)	0.05S…10 h (6 settings)❸	24V…48V AC/DC 24…240V AC 50/60 Hz	700-FEB3TU23	✔
One Shot	1 N.O.	0.75 s…1 h (4 settings)❹	24V AC/DC❶ 110…240V AC 50/60 Hz	700-FED1SU22	
	SPDT (1 C/O)	0.05 s…10 h (6 settings)❸	24V…48V AC/DC 24…240V AC 50/60 Hz	700-FED3TU23	✔
Fleeting Off-delay	SPDT (1 C/O)	0.05 s…10 h (6 settings)❸	24V…48V AC/DC 24…240V AC 50/60 Hz	700-FEE3TU23	
Flasher (repeat cycle starting with pulse)	1 N.O.	0.75 s…1 h (4 settings)❹	24V AC/DC❶ 110…240V AC 50/60 Hz	700-FEF1SU22	
	SPDT (1 C/O)	0.05 s…10 h (6 settings)❸	24V…48V AC/DC 24…240V AC 50/60 Hz	700-FEF3TU23	
Pulse Converter	SPDT (1 C/O)	0.05 s…10 h (6 settings)❸	24V…48V AC/DC 24…240V AC 50/60 Hz	700-FEL3TU23	

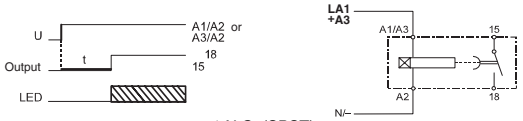
❶ Voltage is either 24V AC or 24V DC 50/60 Hz.
❷ Time ranges: 0.5 s…10 s, 3…60 s, 0.5 s…10 min., 3…60 min.
❸ Time ranges: 0.05 s…1 s, 0.5…10 s, 0.05…1 min., 0.5…10 min, 0.05…1 h, 0.5…10 h.
❹ Time ranges: 0.75…15 s, 3…60 s, 0.4…8 min., 3…60 min.

Special Functions

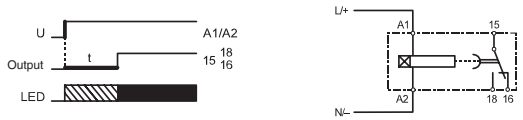
Functions Available	Contact Output	Time Ranges	Supply Voltages	Cat. No.	Factory-stocked Item
Star-delta	2N.O. with 1 Common	0.15 s…10 min. ❶ (4 settings)	24V…48V AC/DC 24…240V AC 50/60 Hz	700-FEY2QU23	

700-FE Function and Connection Diagrams

(A) On-Delay

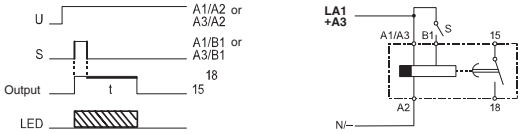


1 N.O. (SPST)

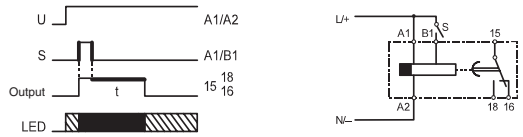


1 C/O (SPDT)

(B) Off-Delay

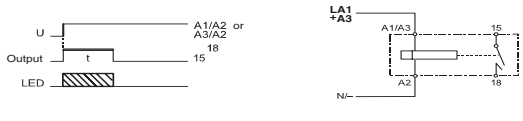


1 N.O. (SPST)

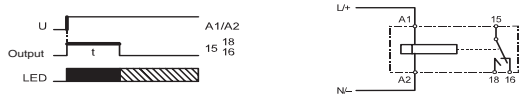


1 C/O (SPDT)

(D) One Shot

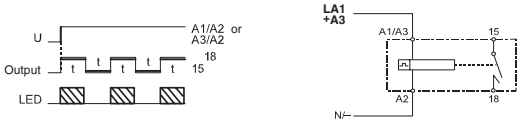


1 N.O. (SPST)

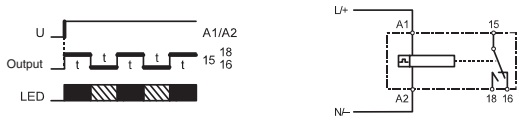


1 C/O (SPDT)

(F) Flasher (Repeat Cycle Starting with Pulse)



1 N.O. (SPST)

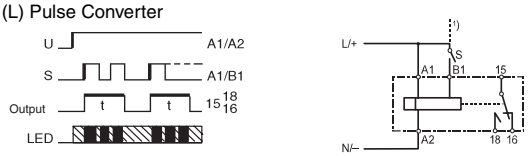


1 C/O (SPDT)

(E) Fleeting Off-delay

1 C/O (SPDT)

(L) Pulse Converter



(Y) Star-delta timing relay

Bi-Color LED: 1 C/O (SPDT) Contact Timers

LED U = green:Supply voltage available
LED Relay = red:Output is energized

LED: 1 N.O. Contact Timers

ON = green
OFF = no color

Single Color LED: 2 N.O. with Common

ON = green
OFF = red

❶ Time ranges: 0.15…3 s, 0.5…10 s, 3 s…1 min., 30 s…10 min.

Accessories

	Description	Qty.	Cat. No.	Factory-stocked Item
	Panel Mounting Adapter For surface mounting according to drilling plan EN 50 002	5	199-FSA	
	Labeling sheet: 10 sheets with 105 self-adhesive paper labels each, 6 x 17 mm	10	100-FMS	

Specifications ❶

Time Characteristics (according to VDE 0435, part 2021)

		1 N.O.	SPDT
Setting Accuracy		±5% of full scale	
Repeatability		±1% of setting (typical)	
Tolerance		By voltage: ±0.01%/%ΔU By temperature: ±0.25%/°C	By voltage: ±0.001%/%ΔU By temperature: ±0.025%/°C
Supply			
Supply Voltage		24V AC/DC ❷ and 110…240V AC, 50/60 Hz	24…48V DC and 24…240V AC, 50/60 Hz
Voltage Tolerance	AC	–15%/+10%	
	DC	–15%/+20%	
Power Consumption		0.5 W at 24V DC, 9 VA at 240V AC	0.5 W at 24V DC, 5 VA at 240V AC
Time Energized		100%	
Reset Time		250 ms	100 ms
Cable Length (Supply Voltage Control)		Max. 100 m (30 feet)	Max. 250 m (75 feet)
Pulse Control (B1)			
Impulse Duration		≥ 250 ms	≥50 ms (AC), ≥ 30 ms (DC)
Input Voltage		supply voltage range	
Input Current		1 mA	
Cable Length		Max. 250 m without parallel load between B1 and A2 Max. 50 m with load (< 3 kΩ) between B1 and A2	
Outputs			
Contact Type		1 N.O. contact	1 Form C – SPDT contact
Switching Capacity	Power	1250 VA	
	According to IEC 947-5-1	AC-1: 5 A /250V AC (resistive load) AC-14: 1 A/250V AC (inductive load) DC-13: 1 A/24V DC (inductive load)	
	According to UL 508	NEMA D300 - 1 A/300V AC	
Short-Circuit Resistance		6 A gL (Fast Blow Fuse)	
Life	Mechanical	20 million operations	
	Electrical	0.4 million at 1 A/250V AC, resistive 0.4 million at 0.5 A/250V AC, cos φ = 0.4 0.4 million at 1 A/24V DC, resistive	
State Indicator		1 LED	1 Bi-Color LED (Supply; Relay)
Certifications		cUL Recognized, File E14840, cULus Listed, File E14840, Guide NKCR,CE Marked (per EU Low Voltage Directive 73/23 EEC 93/68 EEC: per Electromagnetic Compatibility Directive 89/336 EEC 92/31 EEC 93/681 EEC)	
Standards		EN 60947-1,EN 60947-5-1,EN 50081-1,IEC 947,UL 508, CSA 22.2	

❶ Performance Data – See page Important-2, publication A113.
❷ Voltage is either 24V DC or AC 50/60 Hz.

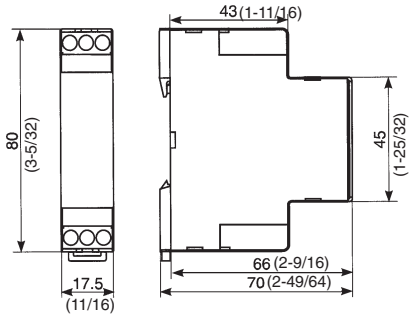
General Specifications

	1 N.O.	SPDT
Insulation Characteristics	2 kV AC/50 Hz test voltage according to VDE 0435 and 4 kV 1.2/50 µs surge voltage according to IEC 947-1 between all inputs and outputs	
EMC/Interference Immunity	The following requirements are fulfilled: Surge capacity of the supply voltage according to IEC 1000-4-5: Level 3 (A1-A2) 110...240V AC according to IEC 1000-4-5: Level 2 (A3-A2) 24V AC/DC ❶ Burst according to IEC 1000-4-4: Level 3 ESD discharge according to IEC 1000-4-2: Level 3	The following requirements are fulfilled: Surge capacity of the supply voltage according to IEC 1000-4-5: Level 3 Burst according to IEC 1000-4-4: Level 3 ESD discharge according to IEC 1000-4-2: Level 3
EMC/Emmission	electromagnetical fields according to EN 55 022: Class B	
Safe Isolation	according to VDE 106, Part 101	
Climatic Withstand	56 cycles (24 h) at 25…40°C and 95% relative humidity according to IEC 68-2-30 and IEC 68-2-3	
Vibration Resistance	4 g in 3 axes at 10…500 Hz, test FC according to IEC 68-2-6	
Shock Resistance	50 g according to IEC 68-2-27	
Protection Class IEC 947-1	Enclosure:IP 40 Terminal:IP 20	
Weight	60 g	60 g
Certifications	cULus, CE Certified	cULus, Germanischer Lloyd, CE Certified
Ambient Temperature	Open:–25…+60°C Enclosed:–25…+45°C Storage:–40…+85°C	
Connections	Screw terminal M3 for Pozidriv No.1, Philips and slotted screws No.2. suitable for power screw-driver. Rated tightening torque 8.8 lb.-in. (max. 1.0 N•m) For terminal cross-sections of 1 x 0.5 mm^2…2 x 1.5 mm^2 (solid) or 2 x 1.5 mm^2 (stranded with sleeve), #20…14 AWG. Finger protection according to VDE 0106	
Mounting	For surface mounting in any position; snap-on mounting on 35 mm DIN Rail or by adapter and 2 screws (M4 type)	
Disposal	Synthetic materials without dioxin according to EC/EFTA-Notification No. 93/0141/D electrical contacts are AgCdO	

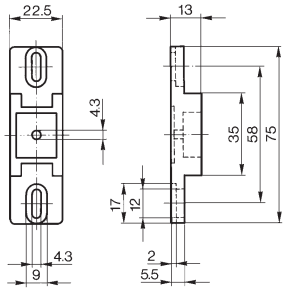
❶ Voltage is either 24V DC or AC 50/60 Hz.

Approximate Dimensions

Approximate Dimensions are shown in millimeters (inches). Approximate Dimensions are not intended to be used for manufacturing purposes.



Cat. No. 199-FE…



Cat. No. 199-FSA…

Bulletin 700-FS

- Adjustable Function and Timing Range Timing Relays
- DIN Rail Mounted without Cost of Socket
- 22.5 mm Wide Multifunction or Single Functions
- Available as SPDT or DPDT Contact Output, 8 A
- Timing Ranges From 0.05s…60h

Table Of Contents

Product Selection 120
Accessories 122
Connection Diagrams 123
Specifications 126

Catalog Number Explanation

700 – FS H 3 U U23

- First Position — **Bulletin Number**
- Second Position — **Type of Relay**
- Third Position — **Function**
- Fourth Position — **Assembly of Contacts**
- Fifth Position — **Time Ranges**
- Sixth Position — **Supply Voltages**

Single-Function (With SPDT 1 C/O contacts)

700-FS	A	3	A	U23
	Function	**Contact Outputs**	**Time Ranges**	**Supply Voltages**
	A On-delay ❶ **B** Off-delay ❶ **C** On- and off-delay ❶ **D** One shot ❶ **E** Fleeting off-delay ❶ **F** Flasher (repeat cycle starts with pulse) ❶ **G** Flasher (repeat cycle starts with pause) ❶ **I** On-delay pulse generator ❶ **J** On-delay (pulse controlled) ❶ **K** One shot / watch dog (pulse controlled) ❶ **L** Pulse converter ❶	**All functions:** **3** 1 Change-over contact (SPDT) 1 C/O	**A** 0.05…1 s **B** 0.15…3 s **C** 0.5…10 s **D** 1.5…30 s **E** 0.05…1 min **F** 0.15…3 min **G** 0.5…10 min **H** 1.5…30 min **I** 0.05…1 h **J** 0.15…3 h **K** 0.5…10 h **L** 3.0…60 h **U** 0.05 s…60 h ❷	**Z12** 12V DC **U23** 24…48V DC 24…240V AC 50/60 Hz

Single Function (With 2PDT 2 C/O contacts)

Functions Available	Contact Outputs	Time Ranges	Supply Voltages	Cat. No.	Factory-stocked Item
ON-Delay	(DPDT) 2 C/O	0.05 s…60 h ❸	12V DC	700-FSA4UZ12	
ON-Delay	(DPDT) 2 C/O		24…48V DC 24…240V AC 50/60 Hz	700-FSA4UU23	✔
OFF-Delay	(DPDT) 2 C/O		12V DC	700-FSB4UZ12	
OFF-Delay	(DPDT) 2 C/O		24…48V DC 24…240V AC 50/60 Hz	700-FSB4UU23	✔

❶ Factory-stocked item.
❷ Valid for functions "A" and "B" only.
❸ The time range of "0.05 s…60 h" is selectable in 12 smaller ranges plus an ON and OFF function for maintenance needs.

Multi-Function (This device offers you the flexibility of selecting one of 8 single timing functions.)

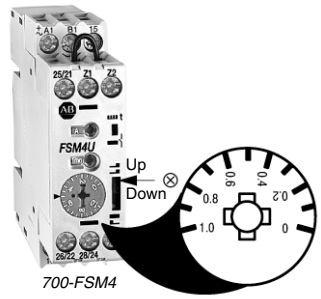
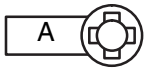
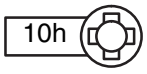
Functions Available	Contact Outputs	Time Ranges	Supply Voltages	Cat. No.	Factory-stocked Item
M Multi-function timing relays 8 Single-functions: A, B, C, D, E, F, I, and L ON and OFF function additional (for installation and maintenance) note: See next page for function description.	(SPDT) 1 C/O	0.05 s…60 h ❶	12V DC	700-FSM3UZ12	
	(SPDT) 1 C/O		24…48V DC 24…240V AC 50/60 Hz	700-FSM3UU23	✔
	(DPDT) 2 C/O		12V DC	700-FSM4UZ12	
	(DPDT) 2 C/O		24…48V DC 24…240V AC 50/60 Hz	700-FSM4UU23	✔

Special Function

Functions Available	Contact Outputs	Time Ranges	Supply Voltages	Cat. No.	Factory-stocked Item
Flasher (Repeat cycle starting with pulse or pause)	SPDT (1 C/O)	0.05 s…60 h ❶	12V DC	700-FSH3UZ12	
			24…48V DC 24…240V AC 50/60 Hz	700-FSHUU23	
		2 x0.05 s…60 h (2 ranges)	12V DC	700-FSH3VZ12	
			24…48V DC 24…240V AC 50/60 Hz	700-FSH3VU23	✔
OFF-delay without supply voltages (True OFF-delay)❸	SPDT (1 C/O)	0.15 s…10 m ❷	24…240V DC 24…240V AC 50/60 Hz	700-FSQ3QU18	✔
	DPDT (2 C/O)			700-FSQ4QU18	✔
Star-Delta	2 N.O. + 1 common	0.5 s…10 s	24…48V DC	700-FSY2CU23	
		1.5…30 s	24…240V AC 50/60 Hz	700-FSY2DU23	
		0.05 s…1 min.		700-FSY2EU23	
		0.15…3 min.		700-FSY2FU23	
		0.5…10 min.		700-FSY2GU23	

❶ The time range of "0.05 s…60 h" is selectable in 12 smaller ranges plus an ON and OFF function for maintenance needs.
❷ This time range is selectable in four smaller ranges: 0.15 s…2.5 s, 0.5 s…10 s,4 s…80 s, 30 s…10 min.
❸ Due to shock during shipment, the state of the contacts should be verified before initial use.

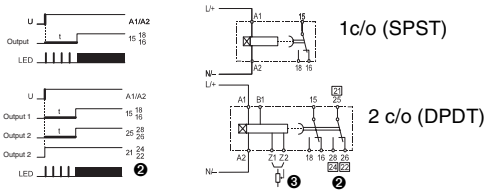
Multi-Function Timing Relay Function and Time Range Settings

Description	SPDT	DPDT
 *700-FSM4*	Multi-function timing relays 700-FSM3U includes 10 setting functions: (A)On-delay (B)Off-delay (C)On- and off-delay (D)One shot (E)Fleeting off-delay (F)Flasher (repeat cycle starts with pulse) (I)On-delay pulse generator (L)Pulse converter (On)ON-Function * (Off)OFF-Function * * (for installation and maintenance) **Note:** Switch ⊗ is on DPDT relays only. When switch is down, one contact is instantaneous and one is timed. When switch is up, both contacts are timed.	**Multi-Time Setting Range 0.05 s…60 h** (1 s)0.05…1 s (3 s)0.15…3 s (10 s)0.5…10 s (1 min)0.05…1 min (3 min)0.15…3 min (10 min)0.5…10 min (1 h)0.05…1 h (3 h)0.15…3 h (10 h)0.5…10 h (60 h)3….60 h
		

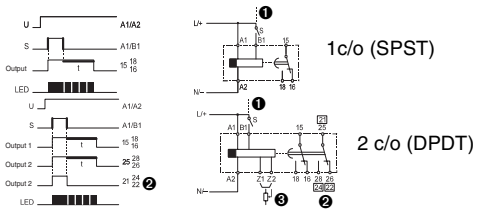
	Description	Qty.	Cat. No.
	Setting Knob with Scale (for time setting without tools)	10	700-FSK
	Panel Mounting Adapter For surface mounting according to drilling plan EN 50 002	5	199-FSA
	Labeling Sheet: 10 sheets with 105 self-adhesive paper labels each, 6 x 17 mm	10	100-FMS
	Marking Tag Sheet: 10 sheets with 160 perforated paper labels each, 6 x 17 mm	10	100-FMP
	Transparent Cover: To be used with marking tag sheets	100	100-FMC
	Marking Tag Carrier: To be used with label strip **System Bulletin 1492-W**	100	100-FMA2 ❶

❶ Cat. No. 100-FMA2 is only a marking tag carrier. Please refer to the Terminal Block Accessories section, page 12-174 of publication A113 for appropriate marker cards to be used with this carrier.

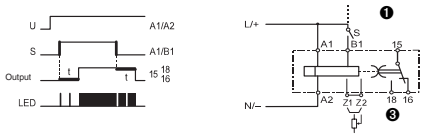
(A) On-Delay



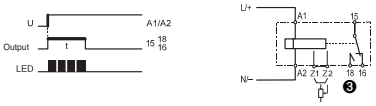
(B) Off-Delay (Min. Pulse AC 50 ms…DC 30 ms)



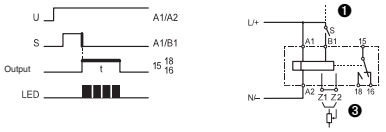
(C) On- and Off-Delay



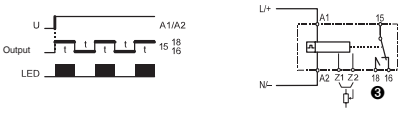
(D) One Shot



(E) Fleeting Off-Delay (Min. Pulse AC 50 ms…DC 30 ms)

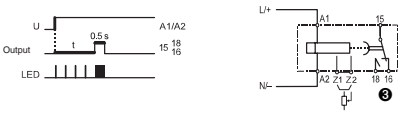


(F) Flasher (Repeat Cycle Starts with Pulse)

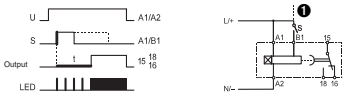


(G) Flasher (Repeat Cycle Starts with Pause)

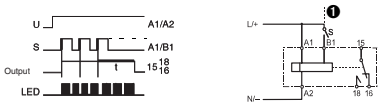
(I) On-Delay Pulse Generator



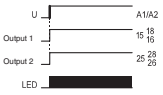
(J) On-Delay (Pulse Controlled)



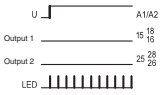
(K) One Shot/ Watch Dog (Pulse Controlled)



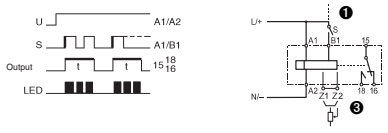
(Off) OFF-Function



(On) ON-Function



(L) Pulse Converter (Min. Pulse AC 50 ms…DC 30 ms)



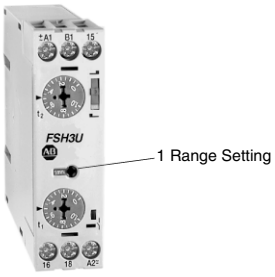
Cleverly Designed Function Display LED (Green)

- Output in rest position, no timing
- Output in rest position, time running
- Output in operation position, no timing
- Output in operation position, time running

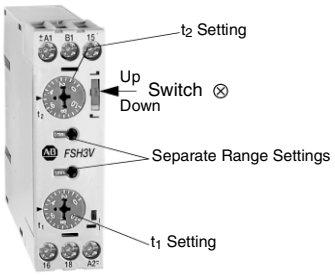
❶ A voltage other than the supply voltage can be used at B1, but must be within voltages specified on timer.
❷ Output 2 is selectable as instantaneous contact with sliding switch (⊗) on front panel (instantaneous when switch is down, timed when switch is up).
❸ Available on multifunction "M," and single function "A" or "B" option timing relays along with code "4" (2PDT contacts). Bridge or potentiometer 10 kΩ, min. 0.25 W (low voltage) for external time setting. Set timer dial to 0.0.

Special Function Flasher (Repeat Cycle Starting with Pulse or Pause) Timing Relays

Description



700-FSH3U



700-FSH3V

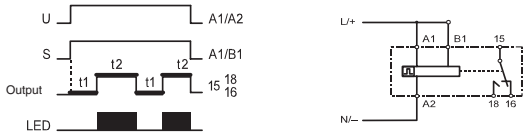
Supply Voltages (A1/A2)
Z12 12V DC
U23 24…48V DC,
24…240V AC, 50/60 Hz

Function Diagram / Connection Diagram

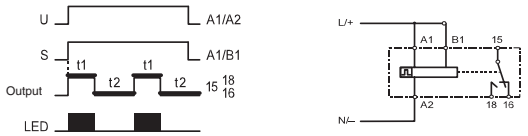
(H) Flasher (Repeat Cycle Starting with Pulse or Pause)
The repeat cycle timer permits different settings for on and off times.
The following operating modes are possible:

- Oscillating mode; repeat cycle starts with voltage applied at A1 and B1, and continues to repeat until voltage is off.
- One cycle mode; started by energizing B1 with voltage on A1 and A2.
- Output starts with pulse or pause (switch ⊗ Up or Down).
- 700-FSH3U provides (1) range setting for t_1 and t_2.
  700-FSH3V provides (2) range settings for t_1 and t_2.

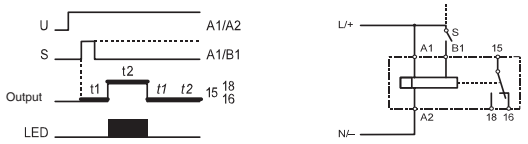
Supply Voltage Controlled, Oscillating Mode Starting with Pause — Switch ⊗ is Up



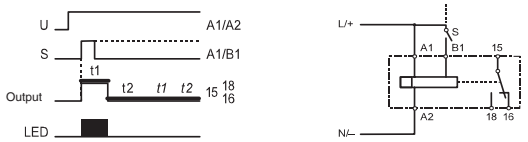
Supply Voltage Controlled, Oscillating Mode Starting with Pulse — Switch ⊗ is Down



Pulse Controlled, Output Starts With Pause (Min. Pulse AC 50 ms — DC 30 ms) — Switch ⊗ is Up One Cycle Mode — Voltage Supplied at A1 and A2, then Pulsing "s" to Energize B1 will Initiate One Cycle.



Pulse Controlled, Output Starts with Pulse (Min. Pulse AC 50 ms — DC 30 ms) — Switch ⊗ is Down One Cycle Mode — Voltage Supplied at A1 and A2, then Pulsing "s" to Energize B1 will Initiate One Cycle.



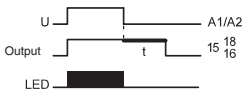
Note: If B1 is pulsed, a one full time cycle consisting of t_1 and t_2 is completed.

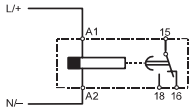
LED Operation Chart — Green LED

LED ———	Output at Shelf State, No Timing – LED Off
LED ┘┘┘┘	Output at Shelf State, Time is Running – LED Flashing
LED ▬▬▬	Output NO Contact is Closed, No Timing – LED On
LED ▬ ▬ ▬	Output NO Contact is Closed, Time is Running – LED Long Flashing

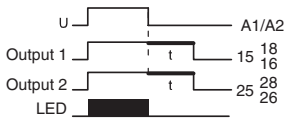
Function Diagram/Connection Diagram

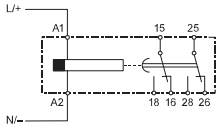
(**Q) Off-Delay without Supply Voltage (True Off-Delay) —** When input power is turned on, the output contact changes state. When the power is removed, the time delay begins. The output contact returns to shelf state at the end of the time delay.



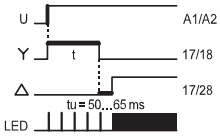


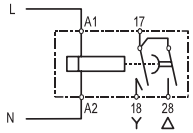
Note: Min. pulse (t) required:
24V DC: 200 ms
24V AC: 325 ms
240V DC: 200 ms
240V AC: 175 ms





(Y) Star-Delta Timing Relay — When power is applied, the output contact 17/18(Y) changes state. After the time setting, the output contact 17/18(Y) returns to shelf state. After the fixed time (50… 60 ms), the output contact 17/28Δ changes state. Both output contacts return to shelf state whenever the power is removed.





Specifications ❶

Time Characteristics (according to VDE 0435, Part 2021)

Setting Accuracy	±5% of full scale
Repeatability	±0.2% of the setting values
Tolerance	Voltage: ±0.001%/%ΔU Temperature: ±0.025%/°C

Supply

Supply Voltages	24…48V DC and 24…240V AC, 50/60 Hz (multi voltage)
Voltage Tolerance	–20…+20% (DC), –15…+10% (AC)
Power Consumption	0.5 W at 24V DC, 5 VA at 240V AC
Time Energized	100%
Reset Time	50 ms
Voltage Interruption	≤ 20 ms without reset (supply voltage)
Cable Length (Supply Voltage Control)	Max. 250 m (800 ft)

Pulse Control (B1)

Pulse Duration	≥ 50 ms (AC), ≥ 30 ms (DC)
Input Voltage	Supply voltage range
Input Current	1 mA
Max. Leakage Current	400 micro Amps
Cable Length	Max. 250 m (800 ft) without parallel load between B1 and A2 Max. 50 m (160 ft) with load (<3 kΩ) between B1 and A2

Outputs

Contact Type	Relay as changeover switch
Switching Capacity	Voltage: 440V AC Current I_{th} (AC-1): 8 A (5 A for 700-FSQ) Power: 2000 VA According to IEC 947-5-1: 3 A/440V AC (inductive load, AC 14) 3 A/250V AC (inductive load, AC 15) 1 A/24V DC (inductive load, DC 13) According to UL 508: 1.5 A/250V AC (B300) 3 A/120V AC (B300)
Short-Circuit Resistance	10 A gL
Life	Mechanical: 30 million operations Electrical operations: 4 Mil. at 1 A/250V AC, cos φ = 1 0.2 Mil. at 6 A/250V AC, cos φ = 1 1.5 Mil. at 1 A/250V AC, cos φ = 0.3 0.3 Mil. at 3 A/250V AC, cos φ = 0.3 0.5 Mil. at 6 A/24V DC, resistive 2 Mil. at 4 A/24V DC, resistive 2 Mil. at 0.2 A/230V DC, resistive 1 Mil. at 0.4 A/24V DC, L/R = 20 ms 1 Mil. at 0.2 A/110V DC, L/R = 20 ms 1 Mil. at 0.1 A/230V DC, L/R = 20 ms
State Indicator	1 LED, combination signal

General Data

Insulation Characteristics	2 kVAC/50 Hz test voltage according to VDE 0435 and 6 kV 1.2/50 µs surge voltage according to IEC 947-1 between all inputs and outputs
EMC/Interference Immunity	Performance of following requirements: Surge capacity of the supply voltage according to IEC 1000-4-5: 4 kV 1.2/50 µs Burst according to IEC 1000-4-4: 6 kV 6/50 ns ESD discharge according to IEC 1000-4-2: Contact 8 kV, air 8 kV Electromagnetic HF field according to IEC 801-3 and conducted electromagnetic HF signal according to IEC 801-6: Level 3
EMC/Emission	Electromagnetic fields according to EN 55 022: class B
Safe Isolation	According to VDE 106, part 101
Climatic Withstand	56 Cycles (24 h) at 25…40°C and 95% relative humidity according to IEC 68-2-30 and IEC 68-2-3
Vibration Resistance	4 g in 3 axes at 10…500 Hz, test FC according to IEC 68-2-6
Shock Resistance	50 g according to IEC 68-2-27
Protection Class	Enclosure:IP 40 IP 30 (Single-function) Terminal:IP 20 according to IEC 947-1
Weight	100 g
Approval	UL, C-UL
Ambient Temperature	Open: –25…+60°C Enclosed: –25…+45°C Storage: –40…+85°C
Terminals	Screw terminal M3.5 for Number 2 Posidrive, Philips, and slotted screws. Suitable for power screwdriver. Rated tightening torque 8.8 lb.-in. (0.8 N•m, max. 1.2 N•m). Dual-chamber system for terminal cross-sections of 1 x 0.5 mm^2…2 x 2.5 mm^2 (solid) or stranded 2 x 2.5 mm^2 (flexible with sleeve), #20…14 AWG. Finger protection according to VDE 0106.
Mounting	Front mounting; For snap-on mounting on 35 mm DIN Rail or screw fixing by adapter and 2 screws (M4 type)
Disposal	Synthetic material without dioxin according to EC/EFTA notification Number 93/0141/D electrical contacts with cadmium
Certifications	cUL Recognized, File E14840, cULus Listed, File E14840,Guide NKCR,CE Marked (per EU Low Voltage Directive 73/23 EEC 93/68 EEC: per Electromagnetic Compatibility Directive 89/336 EEC 92/31 EEC 93/681 EEC)
Standards	EN 60947-1,EN 60947-5-1, EN 50081-1, IEC 947, UL 508, CSA 22.2

❶ Performance Data — See page Important-2, publication A113.

Bulletin 700-HNC

- Miniature Timer, Perfect for Converting &00-HC "Ice Cube" Relays Into Timing Relay
- 4 Operating Modes
- 4PDT Contact Output
- Socket Mounted
- Timing Range From 0.1 s…10 h

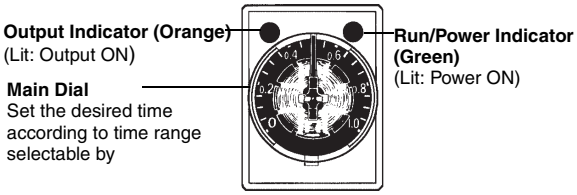
Table Of Contents

Product Selection 127
Accessories 127
Specifications 128
Approximate Dimensions 132

Bulletin 700-HNC Miniature Timer with Multiple Time Ranges

Model	Operating Modes	Output	Input Voltages	Timing Ranges	Sockets	Cat. No.	Factory-stocked Item
Cat. No. 700-HNC	ON-Delay One Shot Repeat cycle, OFF-start Repeat cycle, ON-start	4PDT	12V DC	.1 s…10 min.	700-HN103 700-HN128	700-HNC44AZ12	✔
				.1 min…10 h		700-HNC44BZ12	✔
			24V DC	.1 s…10 min.		700-HNC44AZ24	✔
				.1 min…10 h		700-HNC44BZ24	✔
			48V DC	.1 s…10 min.		700-HNC44AZ48	
				.1 min.…10 h		700-HNC44BZ48	
			100…110V DC	.1 s…10 min.		700-HNC44AZ11	✔
				.1 min.…10 h		700-HNC44BZ11	
			125V DC	.1 s…10 min.		700-HNC44AZ25	
				.1 min.…10 h		700-HNC44BZ25	
			24V AC	.1 s…10 min.		700-HNC44AA24	✔
				.1 min.…10 h		700-HNC44BA24	✔
			100…120V AC	.1 s…10 min.		700-HNC44AA12	✔
				.1 min.…10 h		700-HNC44BA12	✔
			200…230V AC	.1 s…10 min.		700-HNC44AA23	✔
				.1 min.…10 h		700-HNC44BA23	✔

General Timer Functions


Output Indicator (Orange)
(Lit: Output ON)
Main Dial
Set the desired time according to time range selectable by
Run/Power Indicator (Green)
(Lit: Power ON)

Accessories

	Description	Pkg. Qty.	Cat. No.	Factory-Stocked Item
Cat. No. 700-HN103	**Screw Terminal Socket – Panel or DIN Rail Mounting. Guarded Terminal Construction** 14-blade miniature socket for use with Bulletin 700-HNC timers.	1	700-HN103	✔
Cat. No. 700-HN128	**Screw Terminal Base Sockets – Panel or DIN Rail Mounting. Open Style Construction** 14-blade miniature socket for use with Bulletin 700-HNC timers. Order must be for 10 sockets or multiples of 10.	10	700-HN128	✔

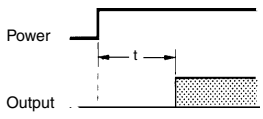
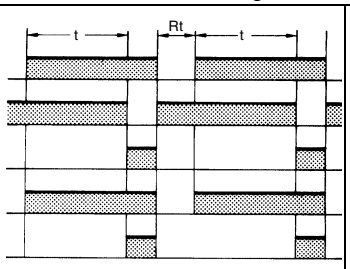
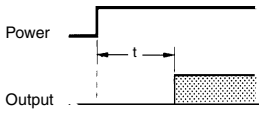
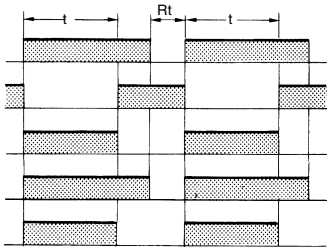
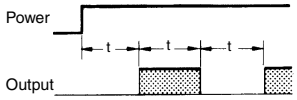
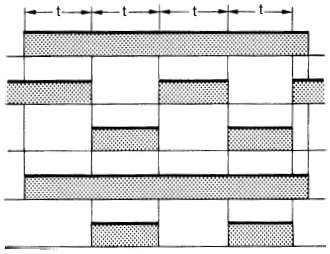
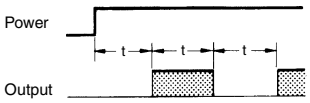
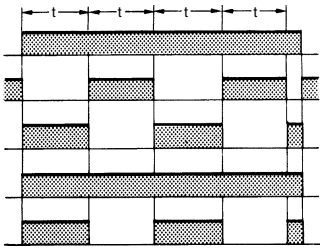
Specifications ❶

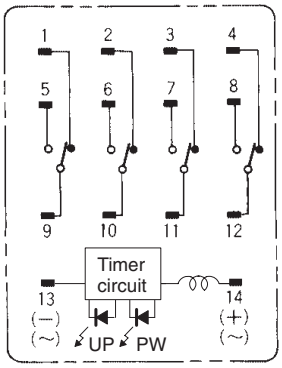
Item	700-HNC
Ratings	
Pilot Duty Rating	NEMA B300
Pin type	Plug-in
Operating voltage range	85%...110% of rated supply voltage (12V DC: 90%...110% of rated supply voltage) ❷
Reset voltage	10% min. of rated supply voltage ❸
Power consumption	24V AC: Relay ON: 1.5 VA (1.1 W) (at 24V AC, 60 Hz) Relay OFF: 0.2 VA (0.1 W) (at 24V AC, 60 Hz) 100...120V AC: Relay ON: 1.5 VA (1.3 W) (at 120V AC, 60 Hz) Relay OFF: 0.8 VA (0.5 W) (at 120V AC, 60 Hz) 200...230V AC: Relay ON: 1.8 VA (1.5 W) (at 230V AC, 60 Hz) Relay OFF: 1.2 VA (0.9 W) (at 230V AC, 60 Hz) 12V DC: Relay ON: 0.9 W (at 12V DC) Relay OFF: 0.07 W (at 12V DC) 24V DC: Relay ON: 0.9 W (at 24V DC) Relay OFF: 0.07 W (at 24V DC) 48V DC: Relay ON: 1.0 W (at 48V DC) Relay OFF: 0.2 W (at 48V DC) 100...110V DC: Relay ON: 1.3 W (at 110V DC) Relay OFF: 0.3 W (at 110V DC) 125V DC: Relay ON: 1.3 W (at 125V DC) Relay OFF: 0.3 W (at 125V DC)
Control outputs	4PDT: 5 A at 250V AC, resistive load ($\cos\phi = 1$)
Characteristics	
►][◄ 120V AC Make 240V AC	30 A 15 A
◄][► 120V AC Break 240V AC	3 A 1.5 A
Hp at 120V AC	1/6 Hp
Hp at 240V AC	1/6 Hp
Accuracy of operating time	±1% FS max. (1 s range: ±1%±10 ms max.)
Setting error	±10%±50 ms FS max.
Reset time	Min. power-opening time: 0.1 s max. (including halfway reset)
Influence of voltage	±2% FS max.
Influence of temperature	±2% FS max.
Insulation resistance	100 MΩ min. (at 500V DC)
Dielectric strength	2,000V AC, 50/60 Hz for 1 min. (between current-carrying terminals and exposed non-current-carrying metal parts) ❶ 2,000V AC, 50/60 Hz for 1 min. (between operating power circuit and control output) 2,000V AC, 50/60 Hz for 1 min. (between different pole contacts; 2-pole model) 1,500V AC, 50/60 Hz for 1 min. (between different pole contacts; 4-pole model) 1,000V AC, 50/60 Hz for 1 min. (between non-continuous contacts)
Vibration resistance	Malfunction:10...55 Hz, 0.5 mm single amplitude
Shock resistance	Malfunction:100 m/s² (approx. 10G)
Ambient temperature	Operating:-10°C...50°C (with no icing) Storage:-25°C...65°C (with no icing)
Ambient humidity	Operating:35%...85%
Life expectancy	Mechanical:10,000,000 operations min. (under no load at 1,800 operations/h) Electrical:4PDT: 200,000 operations min. (H3YN-4-Z/-41-Z: 100,000 operations min.) (3 A at 250V AC, resistive load at 1,800 operations/h)

❶ Single-phase, full-wave-rectified power supplies can be used.
❷ When using the 700-HNC continuously in any place where the ambient temperature is in a range of 45°C...50°C, supply 90%...110% of the rated supply voltages (supply 95%...110% with 12V DC type).
❸ Set the reset voltage as follows to ensure proper resetting.
100...120V AC:10V AC max.
200...230V AC:20V AC max.
100...110V DC:10V DC max.

Characteristics, Continued	
Noise immunity	±1.5 kV, square-wave noise by noise simulator (pulse width: 100 ns/1 μs, 1-ns rise)
Static immunity	Destruction:8 kV Malfunction:4 kV
Enclosure rating	IP40
Weight	Approx. 50 g
EMC	Emission Enclosure:EN55011 Group 1 class A Emission AC Mains:EN55011 Group 1 class A Immunity ESD:EN61000-4-2:4 kV contact discharge (level 2) 8 kV air discharge (level 3) Immunity RF-interference:ENV50140:10 V/m (amplitude modulated, 80 MHz to 1 GHz) (level 3) 10 V/m (pulse modulated, 900 MHz) Immunity Conducted Disturbance:ENV50141:10 V (0.15...80 MHz) (level 3) Immunity Burst:EN61000-4-4:2 kV power-line (level 3) 2 kV I/O signal-line (level 4)
Standards	UL508, CSA 22.2 No. 14 Conforms to VDE0435/P2021, VDE0110 (for in-panel use) Conforms to EN50081-2, EN50082-2

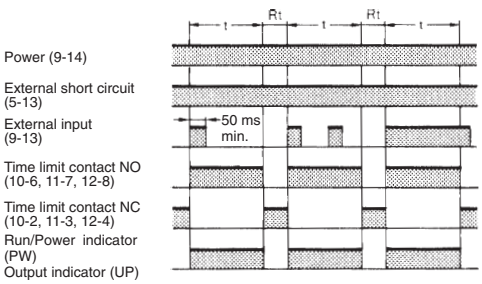
Note:t:Set time
Rt:Reset time

Operating Mode	Timing Charts / Wiring Diagram
ON-Delay 	
One Shot 	
Repeat Cycle OFF-Start 	
Repeat Cycle ON-Start 	

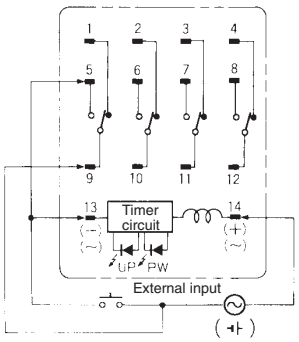


Pulse Operation

A pulse output for a certain period can be obtained with a random external input signal. Use the 700-HNC timing relay in interval mode as shown in the following timing charts.



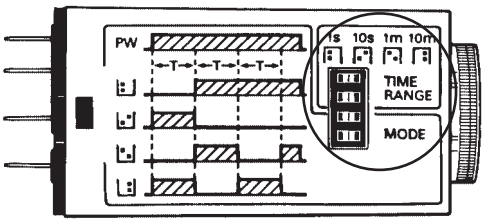
Note: t: Set time
Rt: Reset time



Time Ranges

Cat. No.	Time Range	Time Setting Range	Setting	Factory-Set
700-HNC44AZ12 700-HNC44AZ24 700-HNC44AZ48 700-HNC44AZ11 700-HNC44AZ25 700-HNC44AA24 700-HNC44AA12 700-HNC44AA23	1 s	0.1 s…1 s		Yes
	10 s	1 s…10 s		No
	1 min.	0.1 s…1 min.		No
	10 min.	1 min.…10 min.		No
700-HNC44BZ12 700-HNC44BZ24 700-HNC44BZ48 700-HNC44BZ11 700-HNC44BZ25 700-HNC44BA24 700-HNC44BA12 700-HNC44BA23	1 min.	0.1 min.…1 min.		Yes
	10 min.	1 min.…10 min.		No
	1 h	0.1 h…1 h		No
	1 0 h	1 h…10 h		No

Note: The top two DIP switch pins are used to select the time ranges.



Operating Modes

Operating Mode	Setting	Factory-set
ON-delay		Yes
One Shot		No
Repeat Cycle OFF-start		No
Repeat Cycle ON-start		No

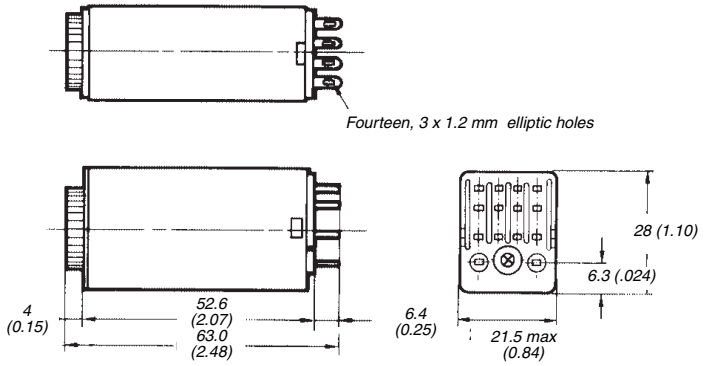
Note: The bottom two DIP switch pins are used to select the time ranges.

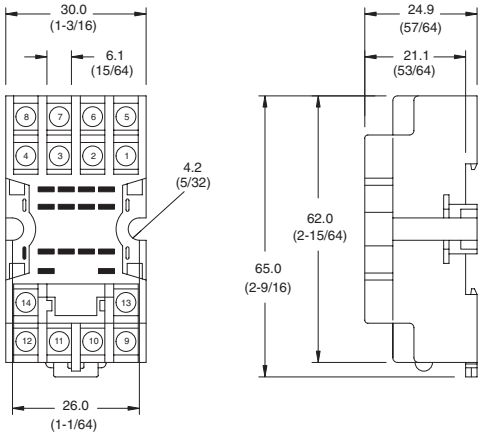
Approximate Dimensions are shown in millimeters (inches) where not specified. Approximate Dimensions are not intended to be used for manufacturing purposes.

Timers

Front Mounting

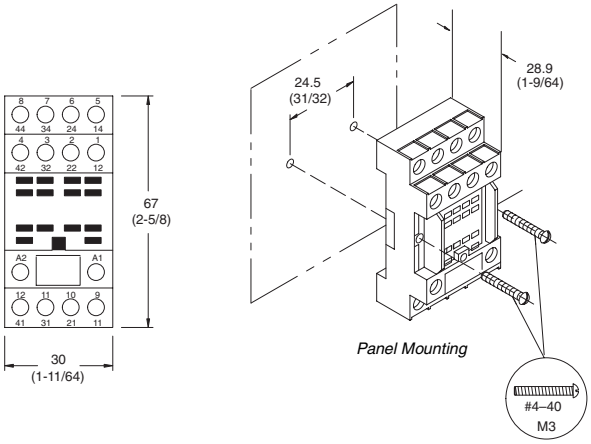
Approximate Dimensions for cat. no. 700-HNC





Cat. No. 700-HN128 ❶

Wire Size: 2 x 1.5 mm² (#2–16 AWG…#1–20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in.) – Torque: 0.8 N•m (7 lb.-in.)



Cat. No. 700-HN103

Wire Size: 2 x 1.5 mm² (#2–16 AWG…#1–20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in.) – Torque: 0.8 N•m (7 lb.-in.)

❶ Total height of 700-HN128 + 700-HNC is 82.5 mm.

Bulletin 700-HNK

- The Ultra-Slim Timing Relay is The Smallest Relay Available
- It is Perfect for Converting 700-HK Relays Into a Timing Relay
- SPDT and DPST-NO Contact Output
- Socket Mounted
- Timing Range From 0.1 s…10 h

Table Of Contents

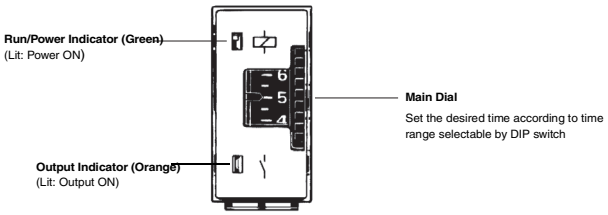
Product Selection 133
Accessories 133
Specifications 134
Approximate Dimensions 138

Bulletin 700-HNK Miniature Timer with Multiple Time Ranges

	Output Modes	Sockets	Outputs	Timing Range	Input Voltage	Cat. No.	Factory-stocked Item
Cat. No. 700-HNK SPDT, DPST-NO	On-Delay One Shot Repeat Cycle, OFF-start Repeat Cycle, ON-start	700-HN121	SPDT ❶	0.1 s…10 min.	12V DC	700-HNK41AZ12	✔
					24V DC	700-HNK41AZ24	✔
					24V AC	700-HNK41AA24	✔
				0.1 min…10 h	12V DC	700-HNK41BZ12	✔
					24V DC	700-HNK41BZ24	✔
					24V AC	700-HNK41BA24	
		700-HN122	DPST-NO ❷	0.1 s…10 min.	12V DC	700-HNK42AZ12	
					24V DC	700-HNK42AZ24	✔
					24V AC	700-HNK42AA24	
				0.1 min…10 h	12V DC	700-HNK42BZ12	
					24V DC	700-HNK42BZ24	✔
					24V AC	700-HNK42BA24	

❶ 5-blade terminal type only.
❷ 6-blade terminal type only.

General Timer Functions


Run/Power Indicator (Green)
(Lit: Power ON)
Output Indicator (Orange)
(Lit: Output ON)
Main Dial
Set the desired time according to time range selectable by DIP switch

Accessories

	Description	Pkg. Qty.	Cat. No.	Factory-stocked Item
Cat. No. 700-HN121	**Screw Terminal Socket — Panel or DIN Rail Mounting** 5-blade miniature socket for use with 1-pole, Type 700-HNK41 timers. Order must be for 10 sockets or multiples of 10.	10	700-HN121	✔
Cat. No. 700-HN122	**Screw Terminal Socket – Panel or DIN Rail Mounting** 8-blade miniature socket for use with 2-pole, Bulletin 700-HNK42 timers. This socket includes a retainer clip. Order must be for 10 sockets or multiples of 10.	10	700-HN122	✔

Timing Relay, Socket, Retainer Clip Reference Chart

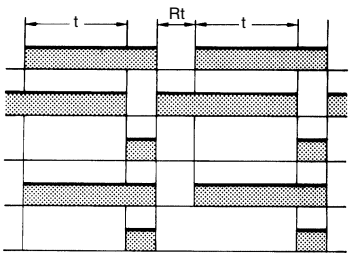
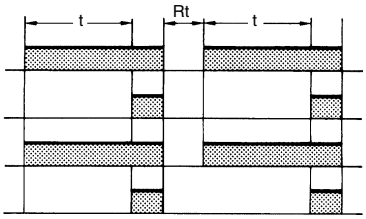
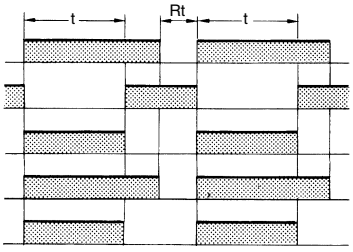
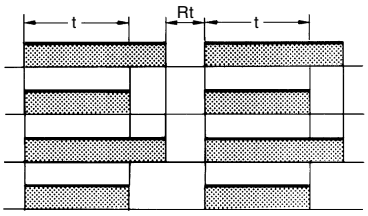
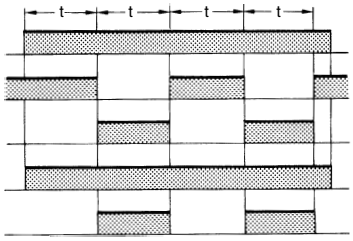
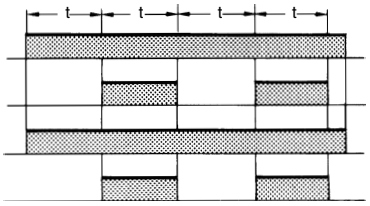
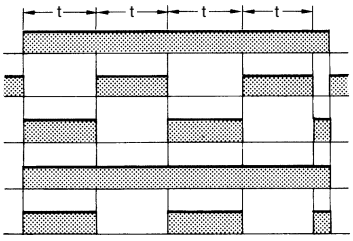
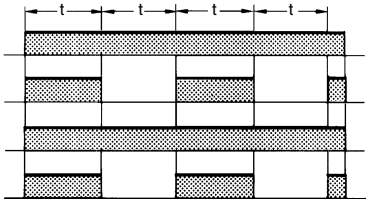
Timer Type	Socket Cat. No.	Retainer Clip Cat. No.
700-HNC	700-HN121 700-HN122	Provided Provided

Specifications ❶

Ratings	
Item	
Pilot Duty Rating	NEMA B300
Rated supply voltage	24V AC; 12, 24V DC
Pin type	Plug-in
Operating mode	ON-delay, One Shot, Repeat Cycle OFF start, or Repeat Cycle ON start selectable with DIP switch
Operating voltage range	85%…110% of rated supply voltage (12 VDC: 90%…110% of rated supply voltage) ❶
Power consumption	24V AC:Relay ON:approx. 0.8 VA (at 24 VAC, 60 Hz) Relay OFF:0.5 VA (at 24V AC, 60 Hz) 12V DC:Relay ON:approx. 0.4 W (at 12V DC) Relay OFF:0.1 W (at 12V DC) 24V DC:Relay ON:approx. 0.5 W (at 24V DC) Relay OFF:0.2 W (at 24V DC)
Control outputs	5 A at 250V AC, resistive load ($\cos\phi = 1$) The minimum applicable load is 10 mA at 5 VDC (P reference value).
Characteristics	
►][◄ 120V AC	30 A
Make 240V AC	15 A
◄][► 120V AC	3 A
Break 240V AC	1.5 A
Hp at 240V AC	1/6 Hp
Accuracy of operating time	±1% FS max. (1 s range: +1%±10 ms max.)
Setting error	±15%+50 ms FS max.
Reset time	Min. power-opening time: 12, 24V DC: 0.1 s max. (including halfway reset) 24V AC: 0.5 s max. (including halfway reset)
Influence of voltage	±2% FS max.
Influence of temperature	±2% FS max.
Insulation resistance	100 MΩ min. (at 500V DC)
Dielectric strength	2,000V AC, 50/60 Hz for 1 min. (between operating circuit and control output, or contacts of different poles) 1,000V AC, 50/60 Hz for 1 min. (between non-continuous contacts)
Vibration resistance	Malfunction:10…55 Hz, 0.5 mm single amplitude
Shock resistance	Malfunction:100 m/s^2 (approx. 10G)
Ambient temperature	Operating:-10°C…50°C (with no icing) Storage:-25°C…65°C (with no icing)
Ambient humidity	Operating:35%…85%
Life expectancy	Mechanical:10,000,000 operations min. (under no load at 1,800 operations/h) Electrical:100,000 operations min. (3 A at 250V AC, resistive load at 1,800 operations/h)
Impulse withstand voltage	Between power terminals: 1 kV
Noise immunity	±1.5 kV, square-wave noise by noise simulator (pulse width: 100 ns/1 μs, 1-ns rise)
Static immunity	Destruction:8 kV Malfunction:4 kV
Enclosure rating	IP20
Weight	Approx. 18 g
EMC	Emission Enclosure:EN55011 Group 1 class A Emission AC Mains:EN55011 Group 1 class A Immunity ESD:EN61000-4-2:4 kV contact discharge (level 2) 8 kV air discharge (level 3) Immunity RF-interference:ENV50140:10 V/m (amplitude modulated, 80 MHz…1GHz) (level 3) 10 V/m (pulse modulated, 900 MHz) Immunity Conducted Disturbance:ENV50141:10 V (0.15…80 MHz) (level 3) Immunity Burst:EN61000-4-4:2 kV power-line (level 3) 2 kV I/O signal-line (level 4)
Approved standards	UL508, CSA 22.2 No. 14 Conforms to VDE 0435/P2021 (for built-in use) Conforms to EN50081-2, EN50082-2, ACA, CE-certified

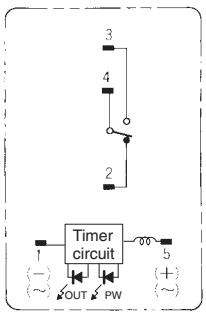
❶ When using 700-HNK timer in any place where the ambient temperature is more than 50°C, supply 90%…110% of the rated voltages (12V DC: 95%…110% of the rated voltage).

Note: t: Set time
Rt: Reset time

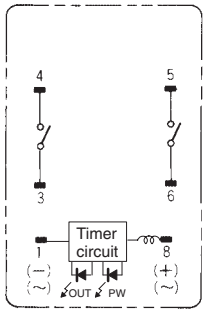
Operating Mode	Timing Chart	
	700-HNK41...	700-HNK42...
ON-Delay Power Output t	Power (1-5) Time limit contact NC (4-2) Time limit contact NO (4-3) Run/Power Indicator (PW) Output Indicator (OUT) 	Power (1-8) Time limit contact NO 4-3, 5-6 Run/Power indicator (PW) Output indicator (OUT) 
Interval Power Output t	Power (1-5) Time limit contact NC (4-2) Time limit contact NO (4-3) Run/Power indicator (PW) Output indicator (OUT) 	Power (1-8) Time limit contact NO (4-3, 5-6) Run/Power indicator (PW) Output indicator (OUT) 
Repeat Cycle OFF-Start Power Output t t t	Power (1-5) Time limit contact NC (4-3) Time limit contact NO (4-3) Run/Power indicator (PW) Output indicator (OUT) 	Power (1-8) Time limit contact NO (4-3, 5-6) Run/Power indicator (PW) Output indicator (OUT) 
Repeat Cycle ON-Start Power Output t t t	Power (1-5) Time limit contact NC (4-2) Time limit contact NO (4-3) Run/Power indicator (PW) Output indicator (OUT) 	Power (1-8) Time limit contact NO (4-3, 5-6) Run/Power indicator (PW) Output indicator (OUT) 

Wiring Diagrams

Cat. No. 700-HNK41...

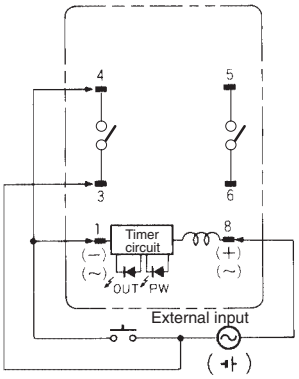


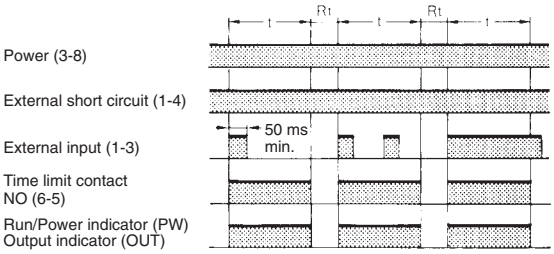
Cat. No. 700-HNK42...



Pulse Operation

A pulse output for a certain period can be obtained with a random external input signal. Use the 700-HNK in interval mode as shown in the following timing chart.





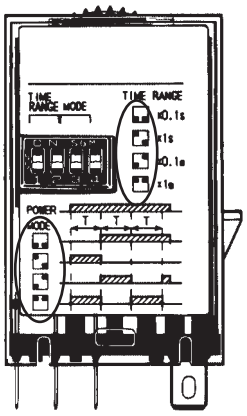
Note: t: Set time
Rt: Reset time

Mode	Terminals
Pulse Operation	Power supply between 3 and 8 Short-circuit between 4 and 1 Input signal between 3 and 1
Operating mode; One shot and all other modes	Power supply between 1 and 8

Time Ranges

Cat. No.	Time Range	Time Setting Range	Setting	Factory-Set
700-HNK41AZ12 700-HNK41AZ24 700-HNK41AA24 700-HNK42AZ12 700-HNK42AZ24 700-HNK42AA24	1 s	0.1 s…1 s		Yes
	10 s	1 s…10 s		No
	1 min.	0.1 s…1 min.		No
	10 min.	1 min…10 min.		No
700-HNK41BZ12 700-HNK41BZ24 700-HNK41BA24 700-HNK42BZ12 700-HNK42BZ24 700-HNK42BA24	1 min.	0.1 min…1 min.		Yes
	10 min.	1 min…10 min.		No
	1 h	0.1 h…1 h		No
	10 h	1 h…10 h		No

Note: The left two DIP switch pins are used to select the time ranges.



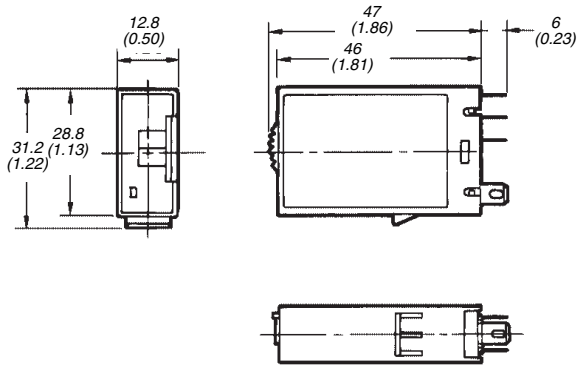
Operating Modes

Operating Mode	Setting	Factory-set
ON-delay		Yes
One Shot		No
Repeat Cycle OFF-start		No
Repeat Cycle ON-start		No

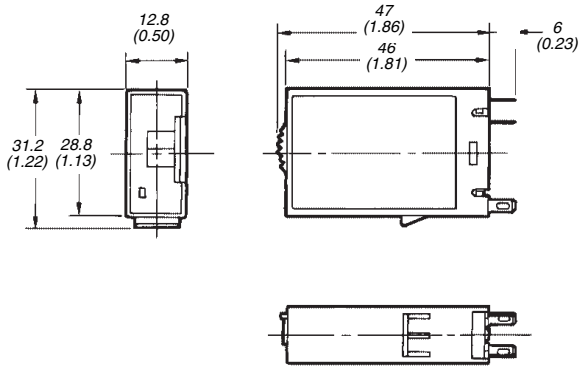
Note: The right two DIP switch pins are used to select the operating modes.

Approximate Dimensions

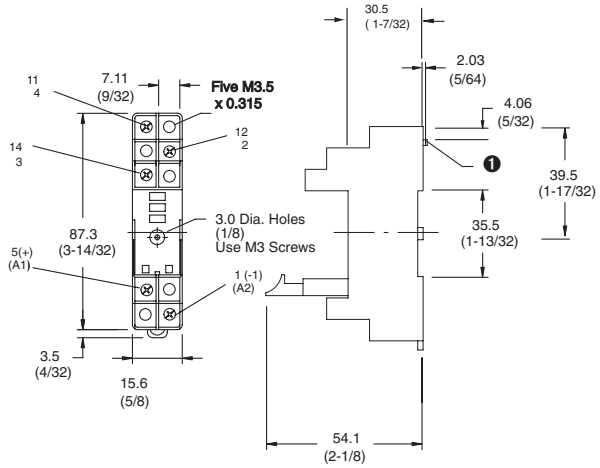
Approximate Dimensions are shown in millimeters (inches). Approximate Dimensions are not intended to be used for manufacturing purposes.



Bulletin 700-HNK41 SPDT Contact Approximate Dimensions



Bulletin 700-HNK42 DPST-NO Contact Approximate Dimensions

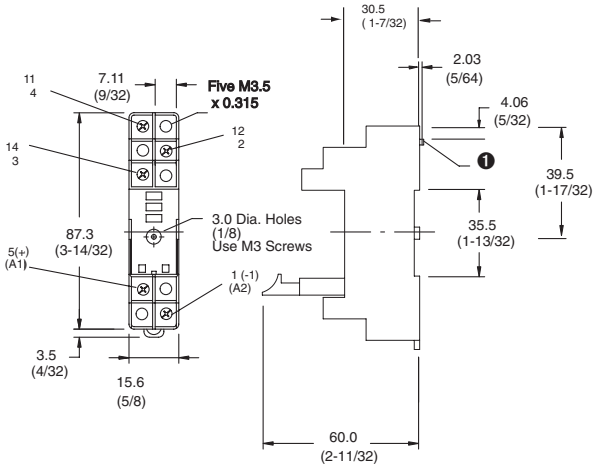


Cat. No. 700-HN121

Wire Size: 2 x 2.5 mm²
Single Wire – Up to #12 AWG
Double Wire – 2 x 2.5 mm² (#2–14 AWG… #2–20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in.) – Torque: 0.8 N•m (7 lb.-in.)

Total height: 700-HN121 + 700-HNK41 is 78.0 mm.

❶ Holes required for mounting [3 mm (1/8 in.) diameter].



Cat. No. 700-HN122

Wire Size: 2 x 2.5 mm²
Single Wire – Up to #12 AWG
Double Wire – 2 x 2.5 mm² (#2–14 AWG… #2–20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8i n.) – Torque: 0.8 N•m (7 lb.-in.)

Total height: 700-HN122 + 700-HNK42 is 78.0 mm.

❶ Holes required for mounting [3 mm (1/8 in.) diameter].

Bulletin 700-HR

- Dial Timing Relays
- Socket or Panel Mounted
- 5 A Contact Ratings or Transistor Outputs
- Single Function or Multi-Function
- Timing Range From 0.05 s…300 h
- Multi-voltage Inputs

Table Of Contents

Product Selection 139
Accessories 143
Specifications 145
Approximate Dimensions 150

Bulletin 700 Multi-Function, Multi-Range Dial Timing Relays with Pin Style Terminations

	Timing Mode	Timing Range	Sockets	Pins	Input Voltage	Contact Outputs	Cat. No.	Factory-stocked Item
Multifunction Timer *Cat. No. 700-HR, -HRP, -HRS, -HRT, -HRV*	A,D,E, B,B2,C	0.05 s….300 h	700-HN101 700-HN126 700-HN129	11	24…48V AC 12…48V DC	DPDT	700-HR52TU24	✔
							700-HRV52TU24 ❶	
						Transistor	700-HRT6TTU24 ❷	
					100…240V AC 100…125V DC	DPDT	700-HR52TA17 ❷	✔
							700-HRV52TA17 ❶	
	A, E,B2,J		700-HN100 700-HN125 700-HN108	8	24…48V AC 12…48V DC	DPDT	700-HRS42TU24	✔
						Transistor	700-HRT4TTU24 ❶	
					24…48V AC/DC	SPDT Timed + Instantaneous Contact	700-HRP42TU24 ❶	✔
					100…240V AC 100…125V DC	SPDT Timed + Instantaneous Contact	700-HRP42TA17	✔
						DPDT	700-HRS42TA17	✔
ON-Delay Timer *Cat. No. 700-HRM, -HRC*	A	0.05 s….300 h	700-HN100 700-HN125 700-HN108	8	24…48V AC/DC	SPDT Timed +Instantaneous Contact	700-HRC12TU24	✔
					24…48V AC 12…48V DC	DPDT	700-HRM12TU24	✔
					100…240V AC	DPDT	700-HRM12TA17	✔
						SPDT Timed + Instantaneous Contact	700-HRC12TA17	✔

Timing mode description

A	D	E	B	B2	C	J
ON-delay	OFF-delay	One Shot	Repeat Cycle OFF-start	Repeat Cycle ON-start	Signal ON/ OFF-delay	One Shot

❶ Voltage Input: Connection to high signal instead of OV signal.

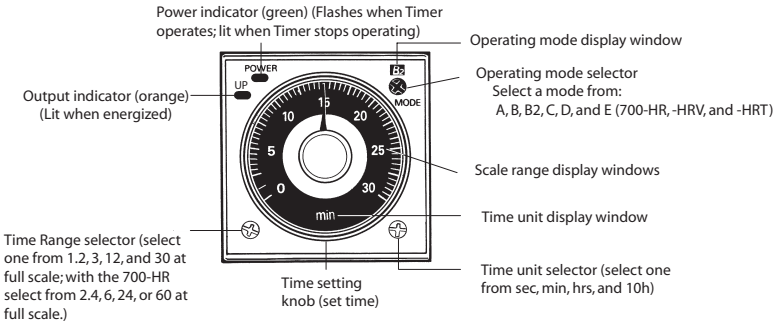
❷ Compatible with connections to 3-wire sensors.

	Timing Mode	Timing Range	Sockets	Pins	Input Voltage	Contact Outputs	Cat. No.	Factory-stocked Item
Twin Timer *Cat. No. 700-HRF…*	B	0.05 s.…30 h	700-HN100 700-HN125 700-HN108	8	12V DC	DPDT	700-HRF72DZ12	
		0.05 s.…30 h	700-HN100 700-HN125 700-HN108	8	24V AC/DC	DPDT	700-HRF72DU25	✔
		0.05 s.…30 h	700-HN100 700-HN125 700-HN108	8	48…125V DC	DPDT	700-HRF72DZ45	
		0.05 s.…30 h	700-HN100 700-HN125 700-HN108	8	100…240V AC	DPDT	700-HRF72DA18	✔
	B2	0.05 s.…30 h	700-HN100 700-HN125 700-HN108	8	12V DC	DPDT	700-HRF82DZ12	
		0.05 s.…30 h	700-HN100 700-HN125 700-HN108	8	24V AC/DC	DPDT	700-HRF82DU25	
		0.05 s.…30 h	700-HN100 700-HN125 700-HN108	8	48…125V DC	DPDT	700-HRF82DZ45	
		0.05 s.…30 h	700-HN100 700-HN125 700-HN108	8	100…240V AC	DPDT	700-HRF82DA18	✔
Star-Delta Timer *Cat. No. 700-HRY…*	Star-Delta	0.5 s.…120 s	700-HN100 700-HN125 700-HN108	8	100…120V AC	SPDT Timed + Instantaneous Contact	700-HRYY6FA12	✔
					200…240V AC		700-HRYY6FA22	✔

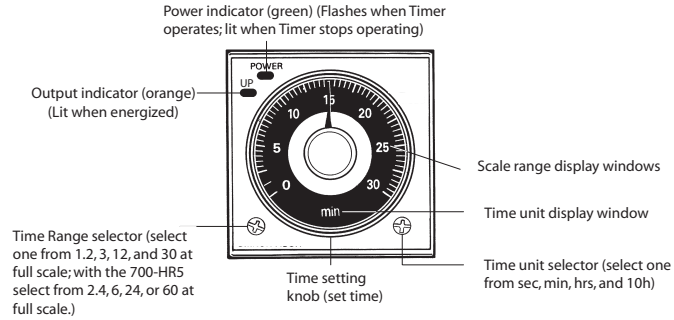
	Timing Mode	Timing Range	Sockets	Pins	Input Voltage	Contact Outputs	Cat. No.	Factory-stocked Item
True OFF-Delay Timer *Cat. No. 700-HRQ…*	True OFF-Delay	0.05 s…12 s	700-HN100 700-HN125 700-HN108	8	100…120V AC	DPDT	700-HRQN2GA12	✔
					200…240V AC	DPDT	700-HRQN2GA22	
			700-HN101 700-HN126 700-HN129	11	100…120V AC	DPDT	700-HRQR2GA12 ❶	
					200…240V AC	DPDT	700-HRQR2GA22 ❶	
		0.05 min… 12 min.	700-HN100 700-HN125 700-HN108	8	100…120V AC	DPDT	700-HRQN2HA12	✔
					200…240V AC	DPDT	700-HRQN2HA22	
			700-HN101 700-HN126 700-HN129	11	100…120V AC	DPDT	700-HRQR2HA12 ❶	
					200…240V AC	DPDT	700-HRQR2HA22 ❶	
		0.05 s…12 s	700-HN100 700-HN125 700-HN108	8	24V AC/DC	DPDT	700-HRQN2GU25	
			700-HN101 700-HN126 700-HN129	11	24V AC/DC	DPDT	700-HRQR2GU25 ❶	
	True OFF-Delay	0.05 min.…12 min.	700-HN100 700-HN125 700-HN108	8	24V AC/DC	DPDT	700-HRQN2HU25	
			700-HN101 700-HN126 700-HN129	11	24V AC/DC	DPDT	700-HRQR2HU25 ❶	
		0.05 s…12 s	700-HN100 700-HN125 700-HN108	8	48V DC	DPDT	700-HRQN2GZ48	
			700-HN101 700-HN126 700-HN129	11	48V DC	DPDT	700-HRQR2GZ48 ❶	
		0.05 min.…12 min.	700-HN100 700-HN125 700-HN108	8	48V DC	DPDT	700-HRQN2HZ48	
			700-HN101 700-HN126 700-HN129	11	48V DC	DPDT	700-HRQR2HZ48 ❶	
		0.05 s…12 s	700-HN100 700-HN125 700-HN108	8	100…125V DC	DPDT	700-HRQN2GZ11	
			700-HN101 700-HN126 700-HN129	11	100…125V DC	DPDT	700-HRQR2GZ11 ❶	
		0.05 min.…12 min.	700-HN100 700-HN125 700-HN108	8	100…125V DC	DPDT	700-HRQN2HZ11	
			700-HN101 700-HN126 700-HN129	11	100…125V DC	DPDT	700-HRQRHZ11 ❶	

❶ Indicates True OFF-delay timer with reset

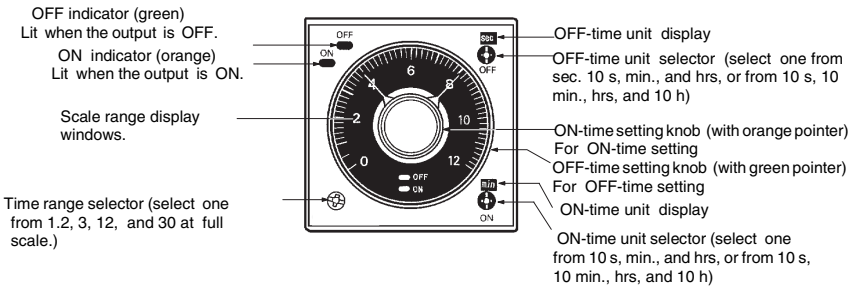
700-HR Multifunction Timer


Power indicator (green) (Flashes when Timer operates; lit when Timer stops operating)
Operating mode display window
Operating mode selector
Select a mode from:
A, B, B2, C, D, and E (700-HR, -HRV, and -HRT)
Output indicator (orange)
(Lit when energized)
Scale range display windows
Time unit display window
Time Range selector (select one from 1.2, 3, 12, and 30 at full scale; with the 700-HR select from 2.4, 6, 24, or 60 at full scale.)
Time setting knob (set time)
Time unit selector (select one from sec, min, hrs, and 10h)
POWER
UP
MODE
min

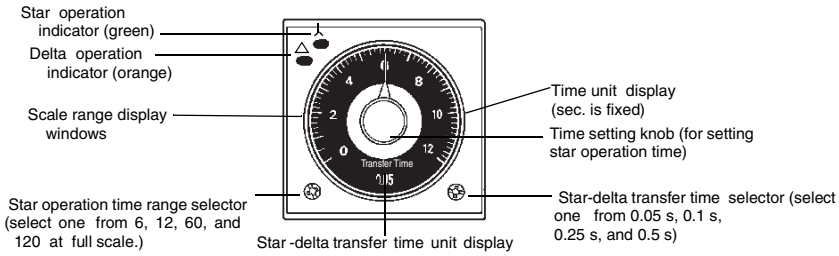
700-HRC -HRM ON-Delay Timer


Power indicator (green) (Flashes when Timer operates; lit when Timer stops operating)
Output indicator (orange)
(Lit when energized)
Scale range display windows
Time unit display window
Time Range selector (select one from 1.2, 3, 12, and 30 at full scale; with the 700-HR5 select from 2.4, 6, 24, or 60 at full scale.)
Time setting knob (set time)
Time unit selector (select one from sec, min, hrs, and 10h)
POWER
UP
min

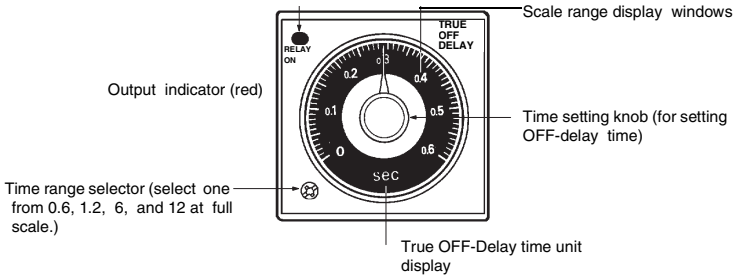
700-HRF Twin Timer


OFF indicator (green)
Lit when the output is OFF.
ON indicator (orange)
Lit when the output is ON.
Scale range display windows.
Time range selector (select one from 1.2, 3, 12, and 30 at full scale.)
OFF-time unit display
OFF-time unit selector (select one from sec. 10 s, min., and hrs, or from 10 s, 10 min., hrs, and 10 h)
ON-time setting knob (with orange pointer)
For ON-time setting
OFF-time setting knob (with green pointer)
For OFF-time setting
ON-time unit display
ON-time unit selector (select one from 10 s, min., and hrs, or from 10 s, 10 min., hrs, and 10 h)
OFF
ON
Sec
Min

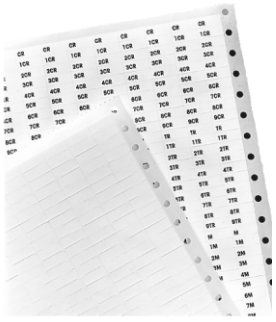
700-HRY Star-Delta Timer


Star operation indicator (green)
Delta operation indicator (orange)
Scale range display windows
Star operation time range selector (select one from 6, 12, 60, and 120 at full scale.)
Star -delta transfer time unit display
Time unit display (sec. is fixed)
Time setting knob (for setting star operation time)
Star-delta transfer time selector (select one from 0.05 s, 0.1 s, 0.25 s, and 0.5 s)
Transfer Time

700-HRQ True OFF-Delay Timer


Scale range display windows
Output indicator (red)
Time setting knob (for setting OFF-delay time)
Time range selector (select one from 0.6, 1.2, 6, and 12 at full scale.)
True OFF-Delay time unit display
RELAY ON
TRUE OFF DELAY
sec

	Description	Pkg. Qty.	Cat. No.	Factory-stocked Item
Cat. No. 700-HN100	**Screw Terminal Tube Base Sockets — Panel or DIN Rail Mounting Guarded Terminal Construction** 8-pin for use with Bulletin 700-HR and 700-HX timing relays. Order must be for 10 sockets or multiples of 10.	10	700-HN100	✔
Cat. No. 700-HN125	**Screw Terminal Tube Base Sockets — Panel or DIN Rail Mounting Open Style Construction** 8-pin for use with Bulletin 700-HRM, and -HRC timing relays. Order must be for 10 sockets or multiples of 10. No retainer clip required.	10	700-HN125	✔
Cat. No. 700-HN101	**Screw Terminal Tube Base Sockets — Panel or DIN Rail Mounting Guarded Terminal Construction** 11-pin for use with Bulletin 700-HR timing relays. Order must be for 10 sockets or multiples of 10. No retainer clip required.	10	700-HN101	✔
Cat. No. 700-HN126	**Screw Terminal Tube Base Sockets — Panel or DIN Rail Mounting Guarded Terminal Construction** 11-pin for use with Bulletin 700-HR timing relays. Order must be for 10 sockets or multiples of 10.	10	700-HN126	✔
Cat. No. 199-DR1	**DIN Rail Mounting Pack** Standard 35 x 7.5 mm DIN Rail, 1 meter long, 10 rails per package. Order must be for 10 rails or multiples of 10.	10	199-DR1	✔
Cat. No. 700-HN108	**Specialty Socket** 8-pin backwired socket with solder terminals for use with Bulletin 700-HR timing relays. Order must be for 10 sockets or multiples of 10.	10	700-HN108	✔
Cat. No 700-HN129	**Specialty Socket** 11-pin backwired socket with solder terminals for use with Bulletin 700-HR timing relays. Order must be for 10 sockets or multiples of 10.	10	700-HN129	✔

	Description	Pkg. Qty.	Cat. No.	Factory-stocked Item
Cat. No. 700-HN130	**Frame Adapter** For flush or door mounting of all Bulletin 700-HR timers.	1	700-HN130	✔
Sample Retainer Clips	**Retainer Clip for Cat. Nos. 700-HN100 and -HN101 Sockets with all 700-HR Timing Relays** Secures timer in socket. Order must be for 10 clips or multiples of 10. Note: Not required for installation	10	700-HN131	✔
Cat. No. 700-HN132	**Protective Cover** Helps prevent tampering of timing and mode settings. Provides a degree of protection against water and dirt from entering the front of the relay. For use with all Bulletin 700-HRs and -HX timing relays.	1	700-HN132	✔
	**Pre-printed identification tags —** contains 10 sheets of pre-printed and blank tags. Each sheet contains 13 sets of the markings CR…9CR, TR…9TR, M…9M, F, R, 1S, and 117 blank tags. Tags are peel-off with sticky backing for easy placement on relays.	10	700-N40	
	Blank identification tags — contains 10 sheets of blank identification tags for customer specialized printing. Each sheet contains 546 blank tags. Tags are peel-off with sticky backing for easy placement on relays.	10	700-N41	

Bulletin 700-HR Multi-function, Multi-Range Dial Timing Relay, Socket, Retainer Clip Reference Chart

Timer Type	Socket Cat. No.	Retainer Clip Cat. No.
700-HR, HRQR2, HRV HRT6	700-HN101 ❷ 700-HN126 ❷ 700-HN129 ❷	700-HN131 Not Required ❶ Not Applicable
700-HRC/HRF/HR5, HRT4, HRM, HRP	700-HN100 ❸ 700-HN108 ❸ 700-HN125 ❸	700-HN131(See note above) Not Applicable Not Required ❶

❶ Design of these sockets holds the timing relays securely and does not require retainer clips.
❷ 11 pins.
❸ 8 pins.

	700-HR, -HRS, -HRV	700-HRP	700-HRC	700-HRM	700-HRF	700-HRY	700-HRQ	700-HRT (Transistor Outputs)
Electrical Ratings								
Pilot Duty Rating	NEMA B300							—
Thermal Current (I_{th})	5 A							100 mA
►][◄ 120V AC	30 A							—
Make 240V AC	15 A							—
◄][► 120V AC	3 A							—
Break 240V AC	1.5 A							—
Hp at 120V	1/6 Hp	1/4 Hp		1/6 Hp		1/4 Hp	1/6 Hp	—
Hp at 240V	1/3 Hp							—
Accuracy of operating time	±0.2% FS max. (±0.2%±10 ms max. in a range of 1.2 s)							
Setting error	±5% FS ±50 ms (The value is ±5% FS +100 ms to -0 ms max. when the C, D, or G mode signal of the 700-HRVs are OFF.)							
Reset time	Min. power-opening time: 0.1 s max. Min. pulse width: 0.05 s (cat nos. 700-HR52TA17, 700-HR52TU24, 700-HRT6TTU24)							
Reset voltage	10% max. of rated voltage							
Influence of voltage	±0.2% FS max. (±0.2%±10 ms max. in a range of 1.2 s)							
Permissible leakage current to switch a gate, signal or reset	10 µA max. (3 wire solid-state)							
Influence of temperature	±1% FS max. (±1%±10 ms max. in a range of 1.2 s)							
Design Specifications								
Dielectric strength	2,000V AC (1,000V AC for 700-HRT), 50/60 Hz for 1 min. (contact to frame) 2,000V AC (1,000V AC for 700-HRT), 50/60 Hz for 1 min. (between control output terminals and operating circuit) 2,000V AC, 50/60 Hz for 1 min. (pole-to-pole) 1,000V AC, 50/60 Hz for 1 min. (between contacts not located next to each other) 2,000V AC, 50/60 Hz for 1 min. (contact to coil)							
Mechanical								
Vibration resistance	Malfunction: 10…55 Hz with 0.5 mm double amplitude each in three directions for ten minutes each							
Shock resistance	Malfunction: 100 m/s² (10 G)				98 m/s² (10 G)	294 m/s² (10 G)	98 m/s² (10 G)	100 m/s² (10 G)
Environmental								
Noise immunity	±1.5 kV for ±600V DC				±400V for 12V DC		±1kV for 48V DC	±1.5 kV for ±600 V DC
Static immunity	Malfunction: 8 kV							
Ambient temperature	Operating: -10°…55°C (with no icing) Storage: -25°…65°C (with no icing)							
Ambient humidity	Operating: 35…85%							
Construction								
Life expectancy (operations min.)	Mechanical:20,000,000. (under no load at 1,800 operations/h Electrical: 100,000 (5 A at 250V AC, resistive load at 1,800 operations/h)						Mech: 10^7 Electrical: 10^4	Mech: 20^7 Electrical: 10^4
EMC	(EMI)EN50081-2 Emission Enclosure:EN55011 Group 1 class A Emission AC Mains: EN55011 Group 1 class A (EMS)EN50082-2 Immunity ESD:EN61000-4-2:4 kV contact discharge (level 2) 8 kV air discharge (level 3) Immunity RF-interference from AM Radio Waves: ENV50140:10 V/m (80 MHz…1 GHz) (level 3) Immunity RF-interference from Pulse-modulated Radio Waves:ENV50204:10 V/m (900±5 MHz) (level 3) Immunity Conducted Disturbance:ENV50141:10 V (0.15…80 MHz) (level 3) Immunity Burst:EN61000-4-4:2 kV power-line (level 3) Immunity Surge:EN61000-4-52 kV I/O signal-line (level 4) 1 kV line to line 2 kV line to ground (level 3)							
Degree of protection	IP40 (panel surface)							
Weight	Approx. 90 g							
Certifications	CSA Certified, File LR60859, UL Recognized, File E14840, Guide NKCR 2,CE Marked (per EU Low Voltage Directive 73/23 EEC 93/68 EEC: per Electromagnetic Compatibility Directive 89/336 EEC 92/31 EEC 93/681 EEC), ACA							
Standards	EN 60947-5-1, EN 50081-2, EN 50082-2,IEC 947, VDE 0435, CSA 22.2,UL 508							

Multifunction and ON-Delay Timer

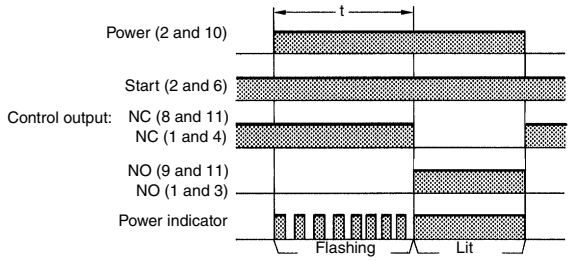
Application Examples

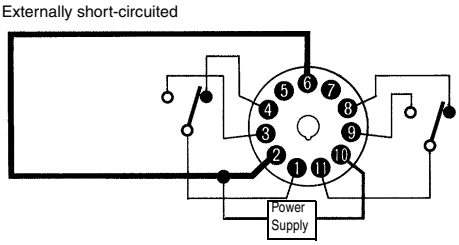
A Mode: Signal ON-Delay

ON-delay operation (A mode) is a basic mode.

1. Power-ON Start/Power-OFF Reset ❶

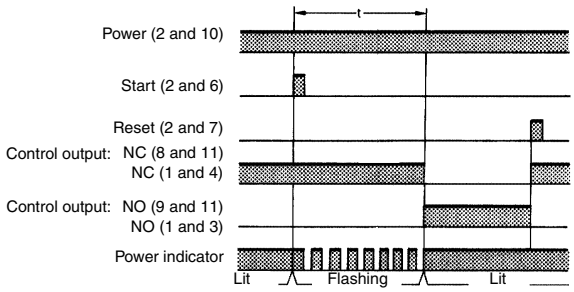
The Power-ON start/Power-OFF reset operation is a standard operating method.

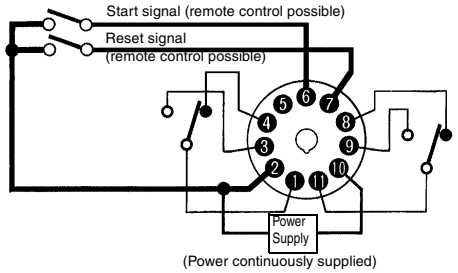




2. Signal Start/Signal Reset ❶

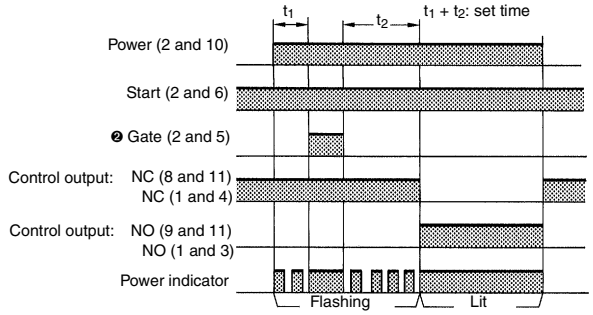
The Signal start/Signal reset operation is useful for remote control of the Timer.



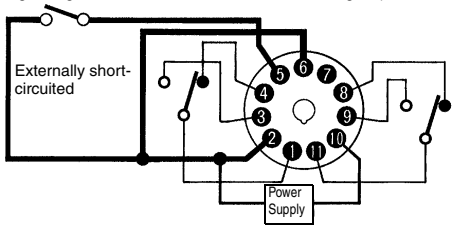


3. Control of Integrated Time with Gate Signal ❶

With a gate signal, the Power-ON start operation and Signal start operation can be controlled (the operation can be interrupted).



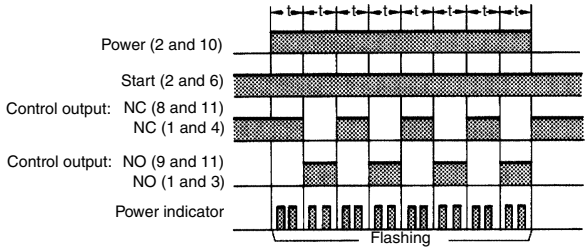
Gate signal (The operation is interrupted with the gate signal if the Timer detects an abnormal signal.)



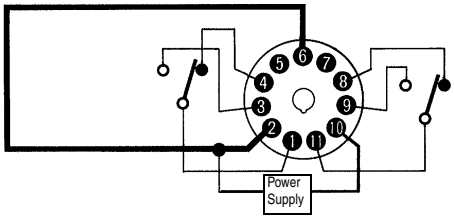
B/B2 Mode: Repeat Cycle

The Repeat Cycle operation in the B and B2 modes can be effectively applied to lamp or buzzer (ON and OFF) alarms or the monitoring of an intermittent operation with a display.

1. Power-ON Start/Power-OFF Reset (in B Mode) ❶



Externally short-circuited

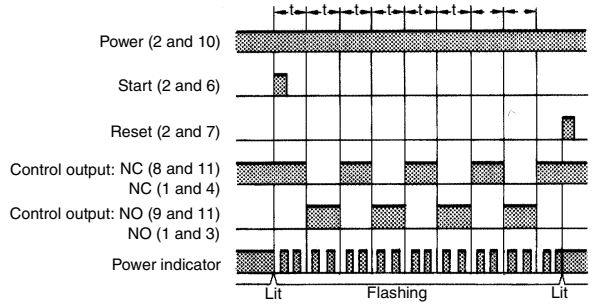


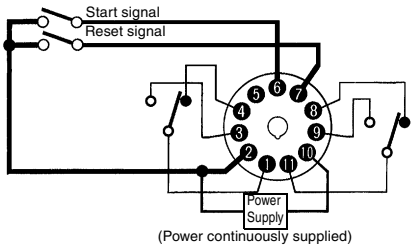
❶ If using a voltage input, connect pin 6 and 10 for DPDT devices.
❷ Gate Signal: A maintained connection is required to allow the timing sequence to complete.

Multifunction and ON-Delay Timer, Continued

2. Signal Start/Signal Reset (in B Mode) ❶

If there is an abnormal signal, flashing starts. When the abnormal condition is restored, a reset signal stops the display flashing.



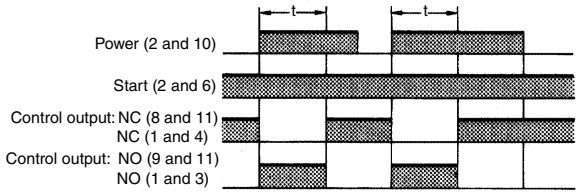


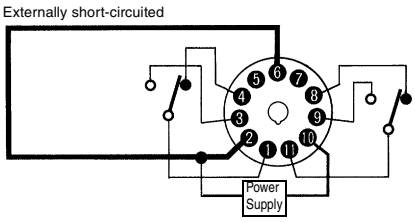
C Mode: Signal ON/OFF-Delay ❶

The Signal ON-/OFF-delay operation (C mode) is useful for the control of distribution of products on a production line into boxes by the specified number or time.

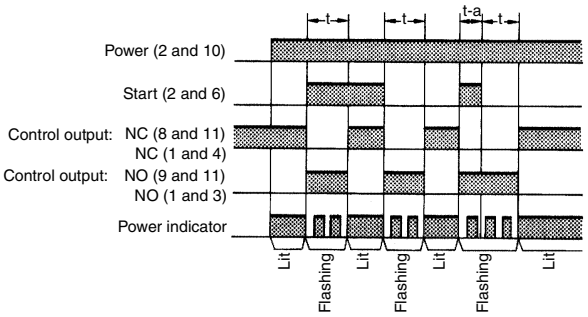
1. Power-ON Start/Instantaneous Operation/Time-Limit Reset

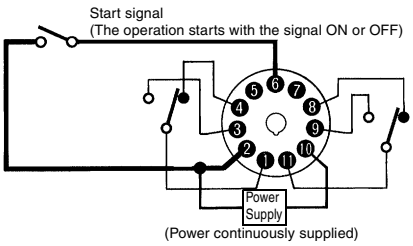
A set of these functions is useful for the operation of a machine for a specified period when power is ON.





2. Signal-ON-OFF Start/Instantaneous Operation/Time-Limit ❶ Reset

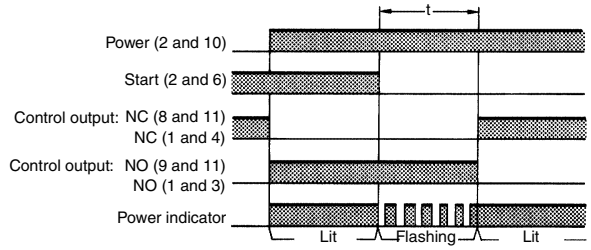


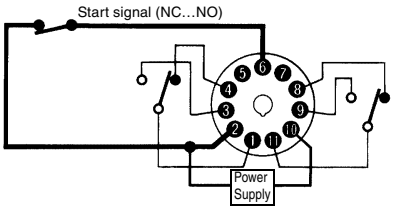


D Mode: Signal OFF-Delay

Signal OFF-delay operation (D mode) can be effectively used to keep a load operating for a certain period. For example, this function enables the cooling fan for a lamp or heater to operate for a certain period after the lamp or heater is switched OFF.

1. Power-ON Start/Instantaneous Operation/Time-Limit Reset ❶

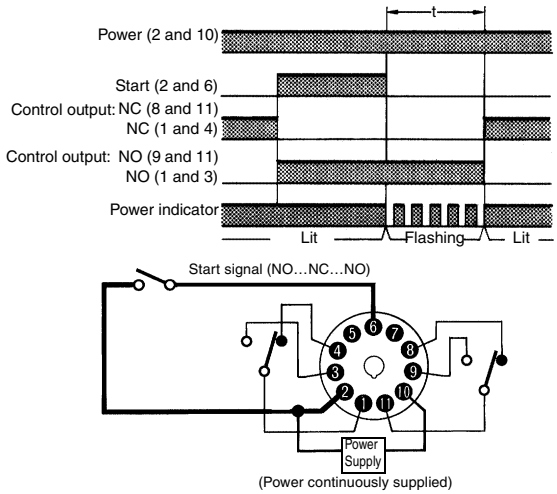




❶ If using a voltage input, connect pin 6 and 10 for DPDT devices.

Multifunction and ON-Delay Timer, Continued

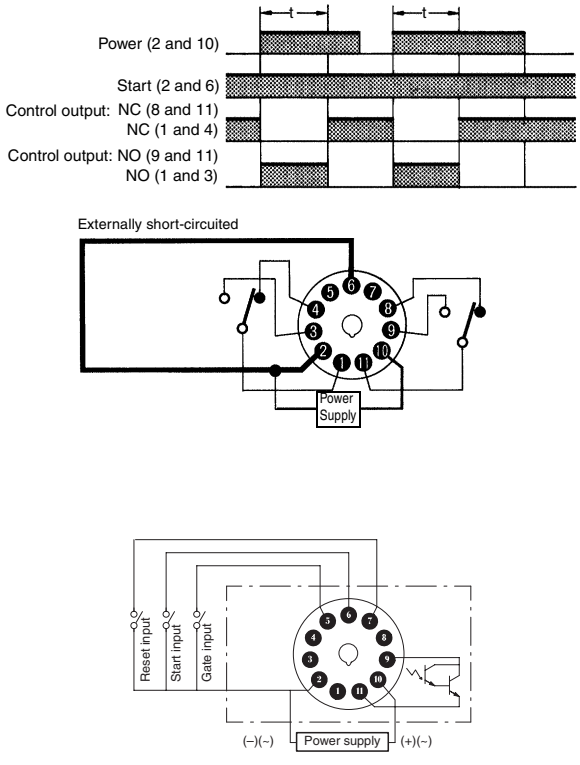
2. Signal Start/Instantaneous Operation/Time-Limit Reset



E Mode: One Shot

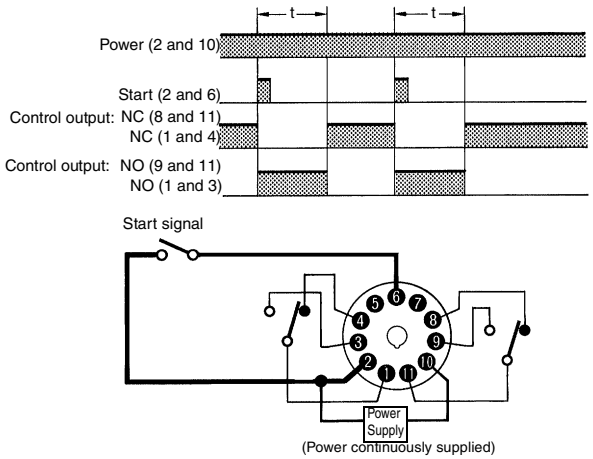
1. Power-ON Start/Instantaneous Operation/Time-Limit Reset

This function is useful for the operation of a machine for a specified period after power is ON.

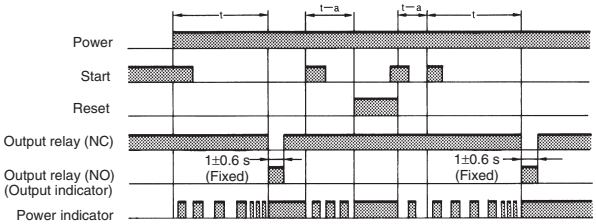


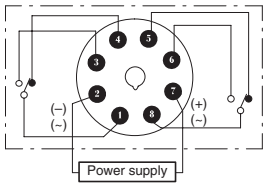
2. Signal Start/Instantaneous Operation/Time-Limit Reset

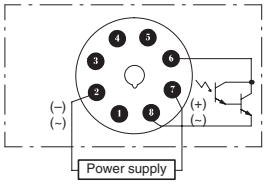
This function is useful for the repetitive control such as the filling of liquid for a specified period after each Signal start input.

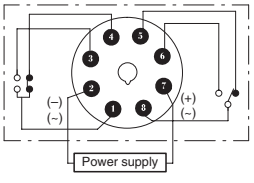


J Mode: ON Delay One Shot







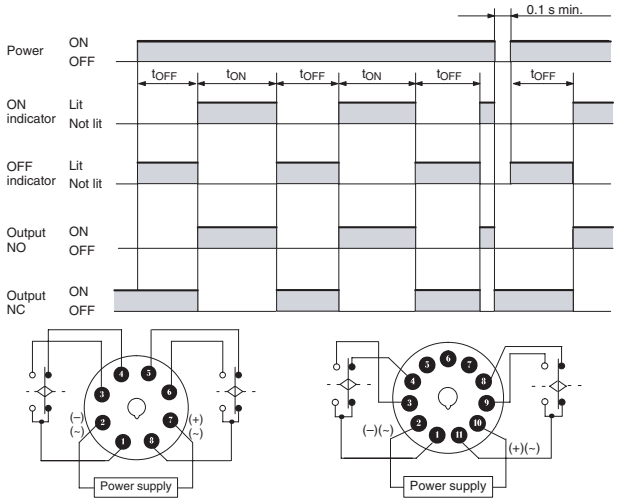


700-HRF Twin Timer, 700 -HRY Star-Delta Timer, and 700- HRQ Off-Delay Timer

B Mode: Repeat Cycle Off-start (700-HRF)

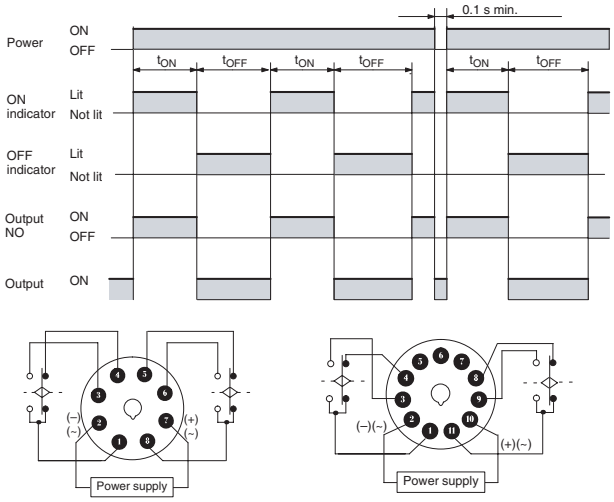
The Repeat Cycle operation in the B mode can be effectively applied to lamp or buzzer (ON and OFF) alarms or the monitoring of an intermittent operation with a display.

1. Power-ON Start/Power-OFF Reset (in B Mode)



B2 Mode: Repeat Cycle On-start (700-HRF)

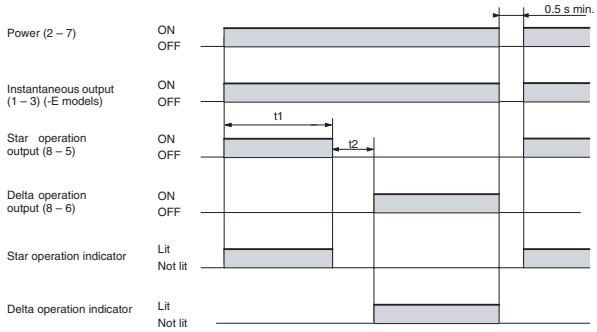
The Repeat Cycle operation in the B2 mode can be effectively applied to lamp or buzzer (ON and OFF) alarms or the monitoring of an intermittent operation with a display



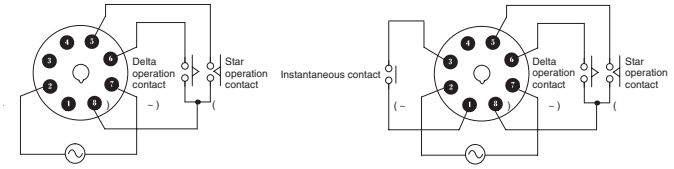
Star-Delta (700-HRY)

1. Power-ON Start/Instantaneous Operation/Time-Limit Reset

This function is useful for the operation of a machine for a specified period after power is ON.



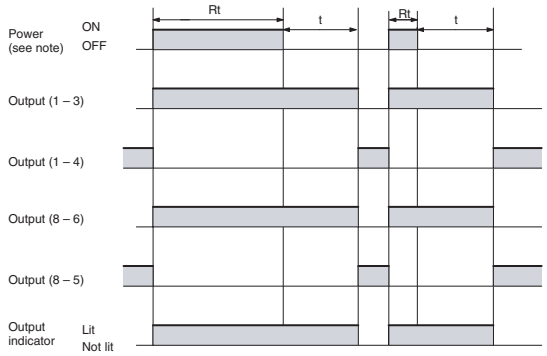
t1: Star operation time setting
t2: Star-delta transfer time



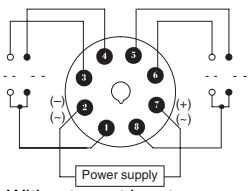
True OFF-Delay (700-HRQ)

Signal OFF-delay operation (D mode) can be effectively used to keep a load operating for a certain period. For example, this function enables the cooling fan for a lamp or heater to operate for a certain period after the lamp or heater is switched OFF.

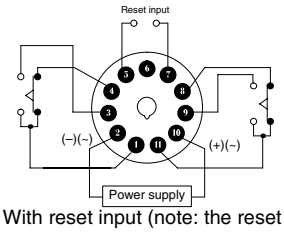
1. Power-ON Start/Instantaneous Operation/Time-Limit Reset



t: Set time
Rt: Minimum Power On



Without reset input

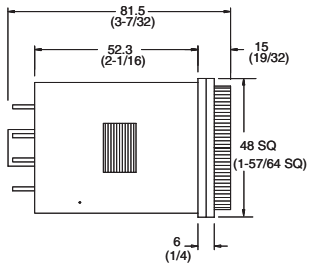


With reset input (note: the reset brings coil to shelf state)

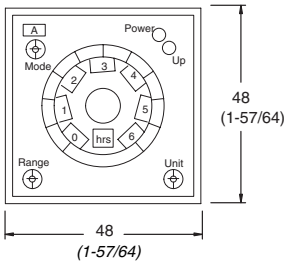
Plug-in Timing Relays

Approximate Dimensions

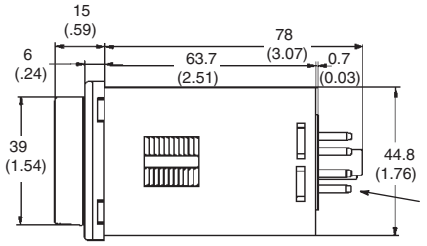
Approximate Dimensions are shown in millimeters (inches). Approximate Dimensions are not intended to be used for manufacturing purposes.



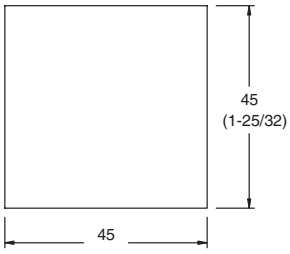
Cat. No. 700-HR, -HRM, -HRC, -HRF, -HRS, -HRV, -HRP
Timing Relay



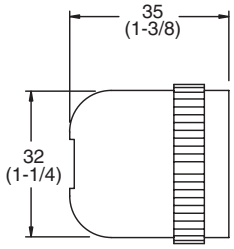
Cat. No. 700-HR…/-HRM…/-HRC…/-HRF…/-HRS…/-HRV…/-HRP…/-HRY…/-HRQ
Timing Relays



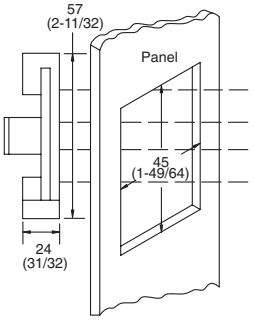
Cat. No. 700-HRY, 700-HRQ
Timing Relay



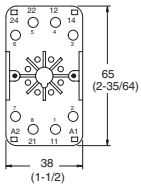
Cat. No. 700-HR…
Panel Cutout

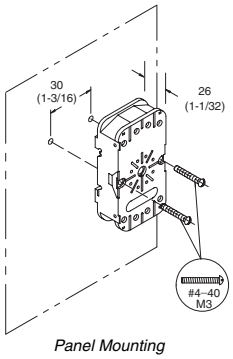


Cat. No. 700-HN129 — 11-Pin
Cat. No. 700-HN108 — 8-Pin
Socket



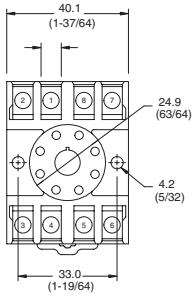
700-HN130
Retainer

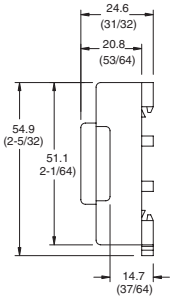




Cat. No. 700-HN100 *Panel Mounting*

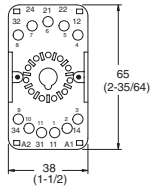
Wire Size: 2 x 2.5 mm²
Single Wire – Up to #12 AWG
Double Wire – 2 x 2.5 mm² (#2–14 AWG… #2–20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in.) – Torque: 0.8 N•m (7 lb.-in.)

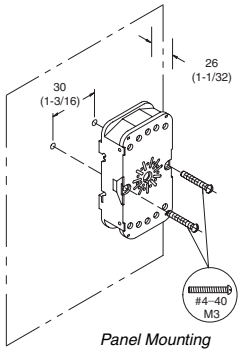




Cat. No. 700-HN125 ❶

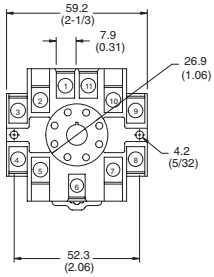
Wire Size: 2 x 2.5 mm²
Single Wire – Up to #12 AWG
Double Wire – 2 x 2.5 mm² (#2–14 AWG… #2–20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in.) – Torque: 0.8 N•m (7 lb.-in.)

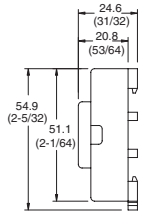




Cat. No. 700-HN101 *Panel Mounting*

Wire Size: 2 x 2.5 mm²
Single Wire – Up to #12 AWG
Double Wire – 2 x 2.5 mm² (#2–14 AWG… #2–20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in.) – Torque: 0.8 N•m (7 lb.-in.)





Cat. No. 700-HN126 ❶

Wire Size: 2 x 2.5 mm²
Single Wire – Up to #12 AWG
Double Wire – 2 x 2.5 mm² (#2–14 AWG… #2–20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in.) – Torque: 0.8 N•m (7 lb.-in.)

❶ Cat. No. 199-FSM Surge Suppressors fit on the coil terminals. See page 187.

Bulletin 700-HS

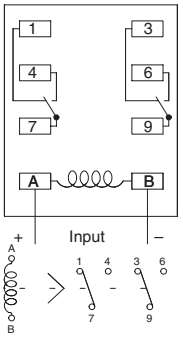
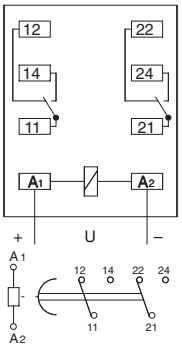
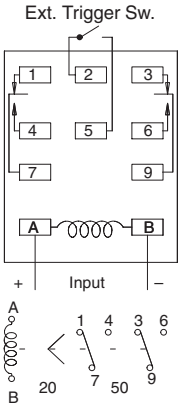
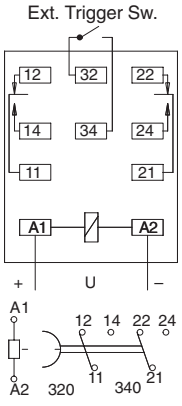
- Timing Relay (On-Delay or Off-Delay)
- Rugged Blade Style Quick Connect Socket Mounting
- 12 A, DPDT Contact Rating
- 0.1 s…180 s Range Available As a Single Range or Fixed Timing

Table Of Contents

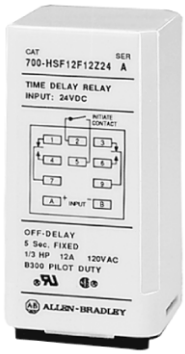
Product Selection 151
Accessories 153
Specifications 154
Approximate Dimensions 155

Single Range Timing Relay with Blade Style Quick Connect/Solder Terminations

Bulletin 700-HS DPDT 2-Pole 2 Form C Contacts

Timing Mode	Wiring Diagrams U.S./Canada	Wiring Diagrams International	Timing Range	Input Voltage	Cat. No.	Factory-stocked Item
On-Delay			0.1…10 s 1.0…180 s	12V DC	700-HS12AZ12 700-HS12BZ12	
			0.1…10 s 1.0…180 s	24V DC	700-HS12AZ24 700-HS12BZ24	✔
			0.1…10 s 1.0…180 s	24V AC	700-HS12AA24 700-HS12BA24	
Socket	**DPDT 12 A Contacts** *700-HN154 or 700-HN153*	**DPDT 12 A Contacts** *700-HN153*	0.1…10 s 1.0…180 s	120V AC	700-HS12AA1 700-HS12BA1	✔ ✔
Off-Delay			0.1…10 s 1.0…180 s	12V DC	700-HS22AZ12 700-HS22BZ12	
			0.1…10 s 1.0…180 s	24V DC	700-HS22AZ24 700-HS22BZ24	
			0.1…10 s 1.0 to 180 s	24V AC	700-HS22AA24 700-HS22BA24	
Socket	Ext. Trigger Switch **DPDT 12 A Contacts** *700-HN154 or 700-HN153*	Ext. Trigger Switch **DPDT 12 A Contacts** *700-HN153*	0.1 to 10 s 1.0 to 180 s	120V AC	700-HS22AA1 700-HS22BA1	✔ ✔

Fixed Timing Relays ❶

	Description
 *Bulletin 700-HSF DPDT 2 Pole 2 Form C Contacts*	Bulletin 700-HSF fixed timing relays feature a plug-in square base with blade style terminations. Construction is the same as the Bulletin 700-HS timing relay except that the adjustment knob has been removed to help prevent unwanted tampering. The timing and output specifications are identical to those of the Bulletin 700-HS timing relay. Setting will be ±5% of the time ordered. Socket: Cat. No. 700-HN153 or 700-HN154

❶ **Availability:** Non-stock items require a minimum order quantity of 25 devices. Consult your local Allen-Bradley Sales Office.

700 – HSF 2 2 F11 A1
a b c d e

a

Timer Type	
Code	**Description**
HSF	Square Base Fixed Timing Relay

b

Mode Type	
Code	**Mode**
1	On-Delay
2	Off-Delay

c

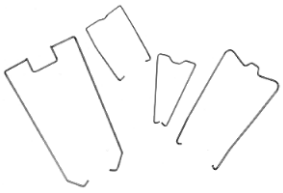
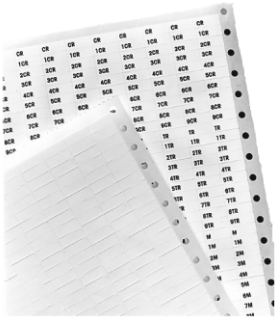
Number of Poles	
Code	**Description**
2	2PDT

d

Timing Range	
Code	**Fixed Time — Type HSF**
F14	0.1 s
F34	0.2 s
F33	0.25 s
F22	0.3 s
F19	0.5 s
F28	0.7 s
F20	0.8 s
F13	1 s
F24	1.2 s
F23	1.5 s
F29	2 s
F11	3 s
F25	4 s
F12	5 s
F17	6 s
F15	10 s
F26	13 s
F30	20 s
F18	30 s
F31	60 s
F32	120 s
F16	180 s
F21	300 s
F27	600 s

e

Coil Voltage		
Code	**Volts**	**Hz**
A24	24	50/60
A1	120	50/60
Z12	12	DC
Z24	24	DC

	Description	Pkg. Qty.	Cat. No.	Factory-stocked Item
Cat. No. 700-HN153	**Screw Terminal Socket — Panel or DIN Rail Mounting** **Guarded Terminal Construction** 11-blade socket for use with Bulletin 700-HB and -HJ relays and -HS timing relays.	1	700-HN153	✔
Cat. No. 700-HN154	**Screw Terminal Base Socket — Panel or DIN Rail Mounting** **Open Style Construction** 11-blade for use with Bulletin 700-HB and -HJ relays and -HS timing relays. Order must be for 10 sockets or multiples of 10.	10	700-HN154	✔
Cat. No. 199-DR1	**DIN Rail Mounting Pack** Standard 35 x 7.5 mm DIN Rail, 1 meter long, 10 rails per package. Order must be for 10 rails or multiples of 10.	10	199-DR1	✔
 *Sample Retainer Clips*	**Retainer Clip for Cat. Nos. 700-HN102, -HN107 and -HN127 Sockets with Bulletin 700-HS Timing Relays ❶** Secures relay in socket. Order must be for 10 clips or multiples of 10.	10	700-HN160	✔
	**Pre-printed identification tags —** contains 10 sheets of pre-printed and blank tags. Each sheet contains 13 sets of the markings CR…9CR, TR…TR, M…9M, F, R, 1S, and 117 blank tags. Tags are peel-off with sticky backing for easy placement on relays.	10	700-N40	
	Blank identification tags — contains 10 sheets of blank identification tags for customer specialized printing. Each sheet contains 546 blank tags. Tags are peel-off with sticky backing for easy placement on relays.	10	700-N41	

❶ Bulletin 700-HS Timing Relay, Socket, and Retainer Clip Reference Chart

Relay Type	Socket	Retainer Clip
700-HS	700-HN153 700-HN154	700-HN160 700-HN160

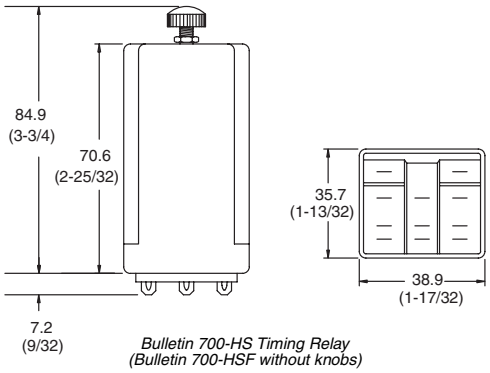
Plug-in Timing Relays

Specifications ❶

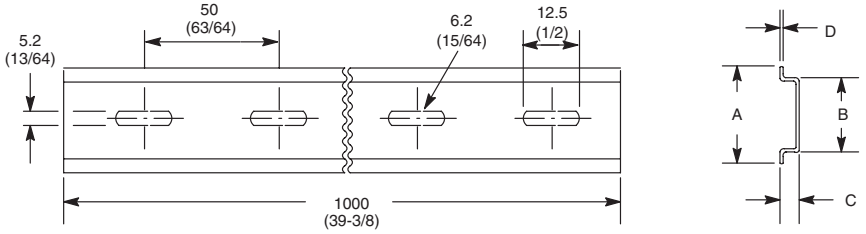
		Cat. No. 700-HS…			Cat. No. 700-HSF…		
Electrical Ratings							
Pilot Duty Rating ❷		NEMA B300					
Rated Thermal Current (I_{th})		12 A					
Rated Insulation Voltage (U_i)		250V IEC, 300V UL/CSA					
Contacts	Inductive	**Make**	**Break**	**Hp**	**Make**	**Break**	**Hp**
	120V AC 240V AC	►][◄ 3 0 A 15 A	◄][► 3 A 1.5 A	1/3 1/2	►][◄ 30 A 15 A	◄][► 3 A 1.5 A	1/3 1/2
	Make, Break, and Continuous V DC	30V, 12 A					
Permissible Coil Voltage Variation		80…110% of Nominal Voltage at 50 Hz 85…110% of Nominal Voltage at 60 Hz 80…110% of Nominal Voltage at DC					
Power Consumption ±10% AC	24V AC 120V AC 240V AC	2.0 VA 2.4 VA —					
DC		1.6 W					
Design Specification/Test Requirements							
Dielectric Withstand Voltage	Pole to Pole (VRMS)	1500V AC					
	Contact to Coil (VRMS)	1500V AC					
Mechanical							
Degree of Protection		Open Type (Guarded Terminal Sockets)					
Mechanical Life Operations		20 x 10^6					
Switching Frequency Operations		1800/HR					
Timing Duty Cycle		Continuous					
Repeat Accuracy ❸ Adjustable Fixed Time Setting		±1% ±5%	±33 ms		Factory-Fixed Time Delay Within +5%		
Timing Change		±10%					
Scale Tolerance	High End of Range	–0…+40%					
	Low End of Range	+0…–40%					
Reset Time		100 ms					
Timing Range		0.1…10 s (A) 1.0…180 s (B)			DPDT Only, On- or Off-Delay Fixed: 0.1…600 s		
Coil Voltages		See Product Selection					
Operating Time at Nominal Voltage at 20°C (ms)	Pickup Dropout	— —			— —		
Maximum Operating Rate		—			—		
Environmental							
Temperature	Operating	–30…+55°C (–22…+131°F)					
	Storage	–55…+85°C (–67…+185°F)					
Altitude		2000 m (6560 ft)					
Construction							
Insulating Material		Molded High Dielectric Material					
Enclosure		Impact Resistant Dust Cover					
Contact Material		Silver Cadmium Oxide					
Terminal Markings on Socket		In accordance with EN50 0005					
Sockets		8- or 11-Blade (On = 8, Off = 11) 700-HN153 -HN154					
Certifications		CSA Certified, File LR41729,UL Recognized, File E3125 Guide NLDX 2, CE Marked (per EU Low Voltage Directive 73/23 EEC 93/68 EEC)					
Standards		EN 60947-4-1, EN 60947-5-1, IEC 947,CSA 22.2, UL 508					

❶ Performance Data — See page Important-2, publication A113.
❷ NEMA Rating Chart is on page 19.
❸ At constant voltage and temperature.

Approximate Dimensions are shown in millimeters (inches). Approximate Dimensions are not intended to be used for manufacturing purposes.

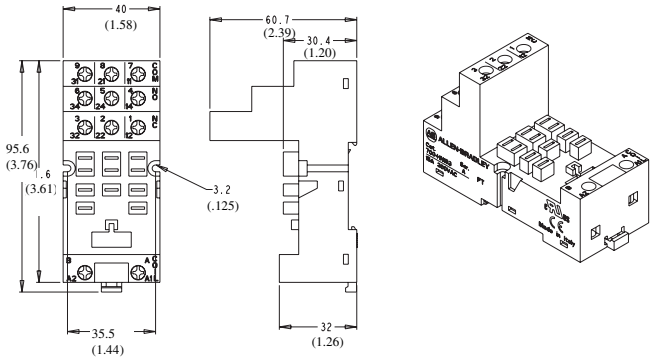


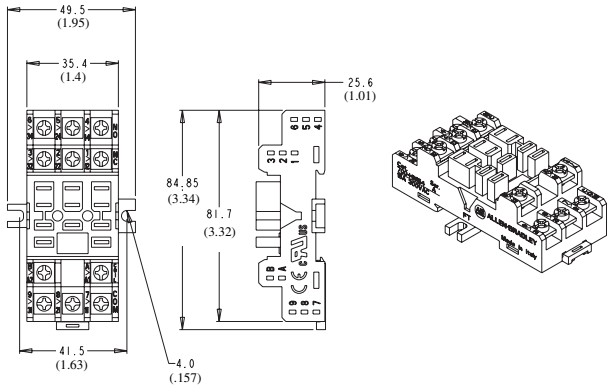
Bulletin 700-HS Timing Relay
(Bulletin 700-HSF without knobs)



Cat. No. 199-DR1 DIN Mounting Rail Series B
Cat. No. 199-DR4 DIN Mounting Rail Series B Has No Mounting Holes

Cat. No.	A	B	C	D	Approx. Shipping Wt.
199-DR1	35 (1-3/8)	27 (1-1/16)	7.5 (19/64)	1.02 (1/64)	1.85 kg (4.07 lbs.) (10/pkg)
199-DR4	35 (1-3/8)	27 (1-1/16)	15 (19/32)	2.3 (3/32)	3.68 kg (8 lbs.) (5/pkg)





Cat. No. 700-HN153

Wire Size: 2 x 2.5 mm²
Single Wire – Up to #12 AWG
Double Wire – 2 x 2.5 mm² (#2–14 AWG… #2–20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in.) – Torque: 0.8 N•m (7 lb.-in.)

Cat. No. 700-HN154 ❶

Wire Size: 2 x 2.5 mm²
Single Wire – Up to #12 AWG
Double Wire – 2 x 2.5 mm² (#2–14 AWG… #2–20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in.) – Torque: 0.8 N•m (7 lb.-in.)

❶ Cat. No. 199-FSM Surge Suppressors fit on the coil terminals. See page 187.

Bulletin 700-HT

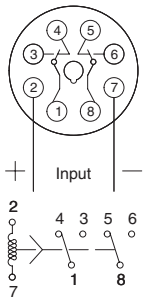
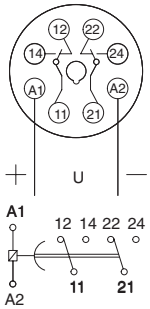
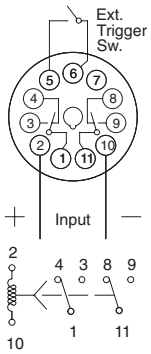
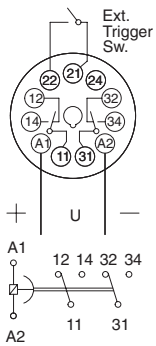
- Timing Relay (On-Delay or Off-Delay)
- Rugged Pin Style Socket Mounting
- 10 A, DPDT Contact Ratings
- 0.1 s…30 min.
- Single or Fixed Timing

Table Of Contents

Product Selection 156
Accessories 158
Specifications 159
Approximate Dimensions 160

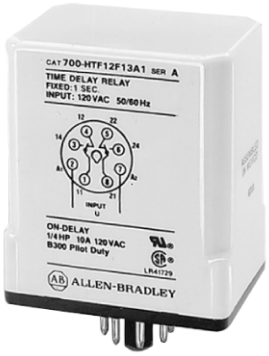
Single Range Timing Relay with Pin Style Terminations

Bulletin 700-HT
DPDT 2-Pole — 2 Form C Contacts

Timing Mode	Wiring Diagrams: U.S./Canada	Wiring Diagrams: International	Timing Range	Input Voltage	Cat. No.	Factory-stocked Item
On-Delay Socket	 *700-HN125 or 700-HN100*	 *700-HN100*	0.1…10 s 1.0…180 s	12V DC	700-HT12AZ12 ❶ 700-HT12BZ12	✔
			0.1…10 s 1.0…180 s	24V DC	700-HT12AZ24 700-HT12BZ24	✔ ✔
			0.1…10 s 1.0…180 s	24V AC	700-HT12AA24 700-HT12BA24	✔ ✔
			0.1…10 s 1.0…180 s	120V AC	700-HT12AA1 700-HT12BA1	✔ ✔
			0.1…10 s 1.0…180 s	240V AC	700-HT12AA2 700-HT12BA2	
Off-Delay Socket	 *700-HN126 or 700-HN101*	 *700-HN101*	0.1…10 s 1.0…180 s	12V DC	700-HT22AZ12 700-HT22BZ12	
			0.1…10 s 1.0…180 s	24V DC	700-HT22AZ24 700-HT22BZ24	
			0.1…10 s 1.0…180 s	24V AC	700-HT22AA24 700-HT22BA24	
			0.1…10 s 1.0…180 s	120V AC	700-HT22AA1 700-HT22BA1	✔ ✔
			0.1…10 s 1.0…180 s	240V AC	700-HT22AA2 700-HT22BA2	

❶ Availability: Non-stock items require a minimum order quantity of 25 devices. Consult your local Allen-Bradley distributor.

Fixed Timing Relays ❶

	Description
 *Bulletin 700-HTF* *DPDT 2 Pole — 2 Form C Contacts*	Bulletin 700-HTF Fixed Timing Relays feature a plug-in tube base. Construction is the same as the Bulletin 700-HT relay except that the adjustment knob has been removed to help prevent unwanted tampering. The timing and output specifications are identical to those of the Bulletin 700-HT relay. Setting time will be ±5% of the time ordered. Socket: Cat. No. 700-HN100 or 700-HN125 (On-Delay) Cat. No. 700-HN101 or 700-HN126 (Off-Delay)

❶ **Availability:** Non-stock items require a minimum order quantity of 25 devices. Consult your local Allen-Bradley Sales Office.

700 – HTF 2 2 F11 A1
a b c d e

a

Timer Type	
Code	**Description**
HTF	Tube Base Fixed Timing Relay

b

Mode Type	
Code	**Mode**
1	On-Delay
2	Off-Delay

c

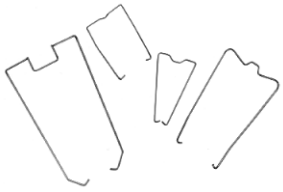
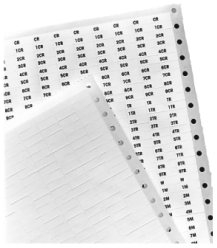
Number of Poles	
Code	**Description**
2	2PDT

d

Timing Range	
Code	**Fixed Time — Type HTF**
F14	0.1 s
F34	0.2 s
F33	0.25 s
F22	0.3 s
F19	0.5 s
F28	0.7 s
F20	0.8 s
F13	1 s
F24	1.2 s
F23	1.5 s
F29	2 s
F11	3 s
F25	4 s
F12	5 s
F17	6 s
F15	10 s
F26	13 s
F30	20 s
F18	30 s
F31	60 s
F32	120 s
F16	180 s
F21	300 s
F27	600 s
F36	1200 s
F38	1800 s

e

Coil Voltage		
Code	**Volts**	**Hz**
A24	24	50/60
A1	120	50/60
Z12	12	DC
Z24	24	DC

	Description	Pkg. Qty.	Cat. No.	Factory-stocked Item
Cat. No. 700-HN100	**Screw Terminal Tube Base Sockets — Panel or DIN Rail Mounting Guarded Terminal Construction** 8-pin for use with DPDT Bulletin 700-HA relays, -HX digital timing relays, -HT (On-Delay) and -HRM, -HRC and -HV (Repeat Cycle) timing relays. Order must be for 10 sockets or multiples of 10.	10	700-HN100	✔
Cat. No. 700-HN125	**Screw Terminal Tube Base Sockets — Panel or DIN Rail Mounting Open Style Construction** 8-pin for use with DPDT Bulletin 700-HA relays, -HT (On-Delay) and -HRM, -HRC and -HV (Repeat Cycle) timing relays. Order must be for 10 sockets or multiples of 10. No retainer clip required.	10	700-HN125	✔
Cat. No. 700-HN101	**Screw Terminal Tube Base Sockets — Panel or DIN Rail Mounting Guarded Terminal Construction** 11-pin for use with 3PDT Bulletin 700-HA relays, -HR and -HT (Off-Delay) timing relays. Order must be for 10 sockets or multiples of 10.	10	700-HN101	✔
Cat. No. 700-HN126	**Screw Terminal Tube Base Sockets — Panel or DIN Rail Mounting Guarded Terminal Construction** 11-pin for use with 3PDT Bulletin 700-HA relays, -HR and -HT (Off-Delay) timing relays. Order must be for 10 sockets or multiples of 10.	10	700-HN126	✔
Cat. No. 199-DR1	**DIN Rail Mounting Pack** Standard 35 x 7.5 mm DIN Rail, 1 meter long, 10 rails per package. Order must be for 10 rails or multiples of 10.	10	199-DR1	✔
 *Sample Retainer Clips*	**Retainer Clip for Cat. Nos. 700-HN100 and -HN101 Sockets with 700-HT Timing Relays ❶** Secures relay in socket. Order must be for 10 clips or multiples of 10.	10	700-HN110	✔
	**Pre-printed identification tags —** contains 10 sheets of pre-printed and blank tags. Each sheet contains 13 sets of the markings CR…9CR, TR…9TR, M…9M, F, R, 1S, and 117 blank tags. Tags are peel-off with sticky backing for easy placement on relays.	10	700-N40	
	Blank identification tags — contains 10 sheets of blank identification tags for customer specialized printing. Each sheet contains 546 blank tags. Tags are peel-off with sticky backing for easy placement on relays.	10	700-N41	

❶ Bulletin 700-HT Timing Relay, Socket, and Retainer Clip Reference Chart

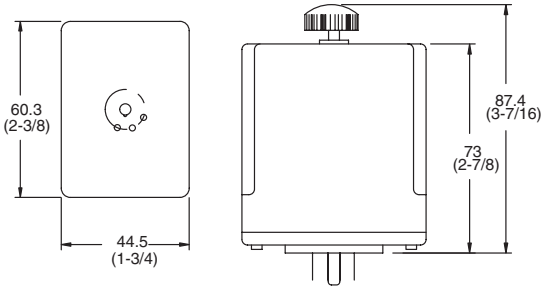
Relay Type	Socket Cat. No.	Retainer Clip Cat. No.
700-HT12	700-HN100 700-HN125	700-HN110 Not Required ❷
700-HT22	700-HN101 700-HN126	700-HN110 Not Required ❷

❷ Design of these sockets holds the relays securely and does not require retainer clips.

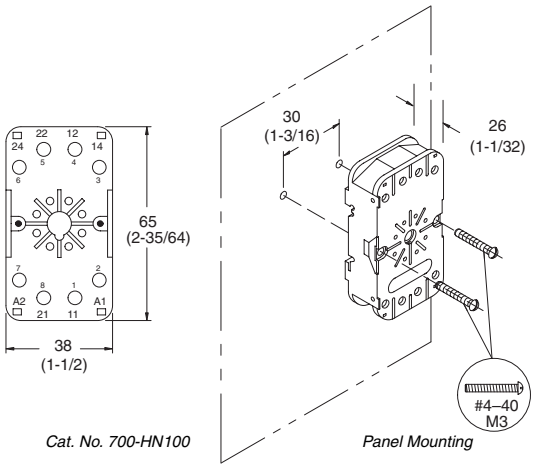
		Cat. No. 700-HT…			Cat. No. 700-HTF…		
Electrical Ratings							
Pilot Duty Rating ❷		NEMA B300					
Rated Thermal Current (I_{th})		10 A					
Rated Insulation Voltage (U_i)		250V IEC, 300V UL/CSA					
Contacts	Inductive	**Make**	**Break**	**Hp**	**Make**	**Break**	**Hp**
		►][◄	◄][►		►][◄	◄][►	
	120V AC 240V AC	30 A 15 A	3 A 1.5 A	1/4 1/3	30 A 15 A	3 A 1.5 A	1/4 1/3
	Make, Break, and Continuous V DC	30V	8 A		30V	8 A	
Permissible Coil Voltage Variation		80…110% of Nominal Voltage at 50 Hz 85…110% of Nominal Voltage at 60 Hz 80…110% of Nominal Voltage at DC					
Power Consumption ±10% AC	24V AC 120V AC 240V AC	2.0V A 2.4V A 3.5V A					
DC		1 W					
Design Specification/Test Requirements							
Dielectric Withstand Voltage	Pole to Pole (VRMS)	1500V AC					
	Contact to Coil (VRMS)	1500V AC					
Mechanical							
Degree of Protection		Open Type (Guarded Terminal Sockets)					
Mechanical Life Operations		10 x 10^6					
Switching Frequency Operations		1800/HR					
Timing Duty Cycle		Continuous					
Repeat Accuracy ❸ Adjustable Time Setting		±1% ±33 ms ±5%			Factory Fixed Time Delay Within +5%		
Timing Change		±10%					
Scale Tolerance	High End of Range	–0…+40%					
	Low End of Range	+0…–40%					
Reset Time		100 ms					
Timing Range		0.1…10 s (A) 1.0…180 s (B)			DPDT Only, On- or Off-Delay Fixed: 0.1…600 s		
Coil Voltages		See Product Selection					
Environmental							
Temperature	Operating	–30…+55°C (–22…+131°F)					
	Storage	–55…+85°C (–67…+185°F)					
Altitude		2000 m (6560 ft)					
Construction							
Insulating Material		Molded High Dielectric Material					
Enclosure		Impact Resistant Dust Cover					
Contact Material		Silver Cadmium Oxide					
Terminal Markings on Socket		In accordance with EN50 0005					
Sockets		8- or 11-Pin Socket (On = 8, Off = 11) 700-HN100, -HN125 700-HN101, -HN126					
Certifications		CSA Certified, File LR41729, UL Recognized, File E3125 Guide NLDX 2,UL Listed, Ind. Cont. Eq. 367G with 700-HN125 or 700-HN126 Sockets, CE-Marked (per EU Low Voltage Directive 73/23 EEC 93/68 EEC)					
Standards		EN 60947-4-1, EN 60947-5-1, IEC 947, CSA 22.2, UL 508					

❶ Performance Data — See page Important-2, publication A113 .
❷ NEMA Rating Chart is on page 19.
❸ At constant voltage and temperature.

Approximate Dimensions are shown in millimeters (inches). Approximate Dimensions are not intended to be used for manufacturing purposes.

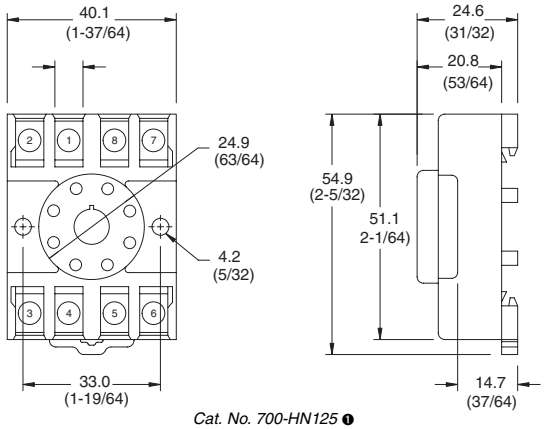


Bulletin 700-HT Timing Relay
(Bulletin 700-HTF without knobs)



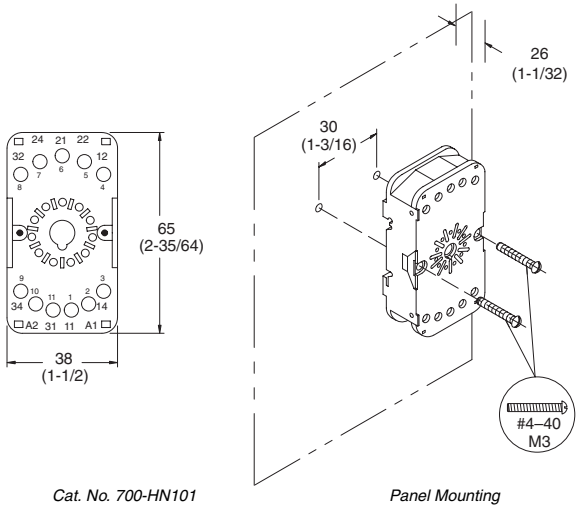
Cat. No. 700-HN100 *Panel Mounting*

Wire Size: 2 x 2.5 mm²
Single Wire — Up to #12 AWG
Double Wire — 2 x 2.5 mm² (#2 – 14 AWG…#2 – 20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in.) – Torque: 0.8 N•m (7 lb.-in.)



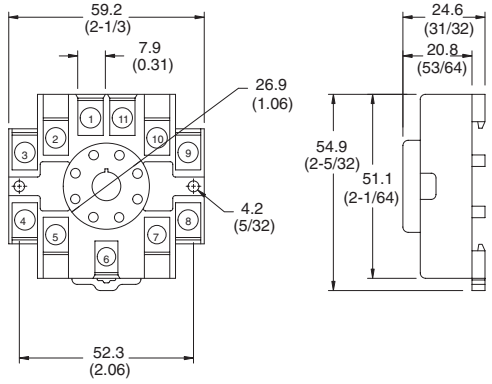
Cat. No. 700-HN125 ❶

Wire Size: 2 x 2.5 mm²
Single Wire – Up to #12 AWG
Double Wire – 2 x 2.5 mm² (#2 – 14 AWG…#2 – 20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in.) – Torque: 0.8 N•m (7 lb.-in.)



Cat. No. 700-HN101 *Panel Mounting*

Wire Size: 2 x 2.5 mm²
Single Wire — Up to #12 AWG
Double Wire — 2 x 2.5 mm² (#2 – 14 AWG… #2 – 20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in.) — Torque: 0.8 N•m (7 lb.-in.)



Cat. No. 700-HN126 ❶

Wire Size: 2 x 2.5 mm²
Single Wire — Up to 12 AWG
Double Wire — 2 x 2.5 mm² (#2 – 14 AWG…#2 – 20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in.) — Torque: 0.8 N•m (7 lb.-in.)

❶ Cat. No. 199-FSM Surge Suppressors fit on the coil terminals. See page 187.

Bulletin 700-HV

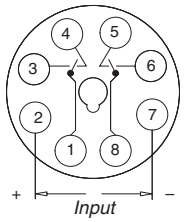
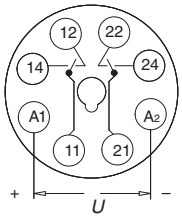
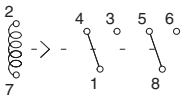
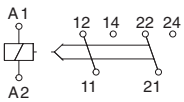
- Repeat Cycle Timing Relay
- 10 A Contact Rating
- DPDT
- Pin Style Terminals
- 0.1 s…30 min.
- Repeat Cycle Adjustable Timing
- Two Timing Adjustments $T_1 \neq T_2$

Table Of Contents

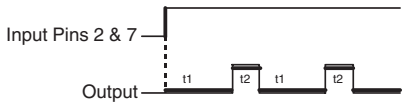
Product Selection **161**
Accessories **162**
Specifications **163**
Approximate Dimensions **164**

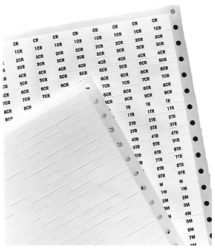
Repeat Cycle Timing Relays with Pin Style Terminations with 2 Adjustments ($T_1 \neq T_2$)

Bulletin 700-HV
Repeat Cycle Timing Relay
DPDT 2-Pole — 2 Form C Contacts

Timing Mode	Wiring Diagrams U.S./Canada	Wiring Diagrams International	Timing Range	Input Voltage	Cat. No.	Factory-Stocked Item
Repeat Cycle			0.1…10 s 1.0…180 s	24V DC 24V DC	700-HV32AZ24 700-HV32BZ24	
			0.1…10 s 1.0…180 s	24V AC 24V AC	700-HV32AA24 700-HV32BA24	✔
			0.1…10 s 1.0…180 s 2.0…30 minutes	120V AC 120V AC 120V AC	700-HV32AA1 700-HV32BA1 700-HV32DA1	✔ ✔
Socket	 *700-HN125 or 700-HN100*	 *700-HN100*	0.1…10 s 1.0…180 s	240V AC 240V AC	700-HV32AA2 700-HV32BA2	

Repeat Cycle



	Description	Pkg. Qty.	Cat. No.	Factory-stocked Item
Cat. No. 700-HN100	**Screw Terminal Tube Base Sockets — Panel or DIN Rail Mounting Guarded Terminal Construction** 8-pin for use with DPDT Bulletin 700-HA relays, -HX digital timing relays, -HT (ON-Delay) and -HRM, -HRC and -HV (Repeat Cycle) timing relays. Order must be for 10 sockets or multiples of 10.	10	700-HN100	✔
Cat. No. 199-DR1	**DIN Rail Mounting Pack** Standard 35 x 7.5 mm DIN Rail, 1 meter long, 10 rails per package. Order must be for 10 rails or multiples of 10.	10	199-DR1	✔
Cat. No. 700-HN125	**Screw Terminal Tube Base Sockets — Panel or DIN Rail Mounting Open Style Construction** 8-pin for use with DPDT Bulletin 700-HA relays, -HT (ON-Delay) and -HRM, -HRC and -HV (Repeat Cycle) timing relays. Order must be for 10 sockets or multiples of 10. No retainer clip required.	10	700-HN125	✔
	**Pre-printed identification tags —** contains 10 sheets of pre-printed and blank tags. Each sheet contains 13 sets of the markings CR…9CR, TR…9TR, M…9M, F, R, and 1S and 117 blank tags. Tags are peel-off with sticky backing for easy placement on relays.	10	700-N40	
	Blank identification tags — contains 10 sheets of blank identification tags for customer specialized printing. Each sheet contains 546 blank tags. Tags are peel-off with sticky backing for easy placement on relays.	10	700-N41	

Bulletin 700-HV Repeat Cycle Timing Relay, Socket, and Retainer Clip Reference Chart

Relay Type	Socket Cat. No.	Retainer Clip Cat. No.
700-HV	700-HN100 700-HN125	700-HN110 Not Required ❶

❶ Design of these sockets holds the relays securely and does not require retainer clips.

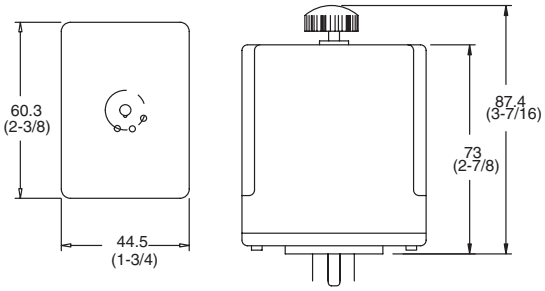
		Cat. No. 700-HV…			Cat. No. 700-HVF…		
Electrical Ratings							
Pilot Duty Rating ❷		NEMA B300					
Rated Thermal Current (I_{th})		10 A					
Rated Insulation Voltage (U_i)		250V IEC, 300V UL/CSA					
Contacts	Inductive	**Make**	**Break**	**Hp**	**Make**	**Break**	**Hp**
	120V AC 240V AC	▶][◀ 30 A 15 A	◀][▶ 3 A 1.5 A	 1/3 1/2	▶][◀ 30 A 15 A	◀][▶ 3 A 1.5 A	 1/3 1/2
	Make, Break, and Continuous V DC	30V	8 A		30V	10 A	
Permissible Coil Voltage Variation		80…110 of Nominal Voltage at 50 Hz 85…110 of Nominal Voltage at 60 Hz 80…110 of Nominal Voltage at DC					
Power Consumption ±10% AC	24V AC 120V AC 240V AC	2.0 VA 2.4 VA 3.5 VA					
DC		1 W					
Time Module Solid-State	Output Current Max.: Output Voltage Max.: Output Power Max.	—			—		
Design Specification/Test Requirements							
Dielectric Withstand Voltage	Pole-to-Pole (VRMS)	1500V AC					
	Contact-to-Coil (VRMS)	1500V AC					
Mechanical							
Degree of Protection		Open Type (Guarded Terminal Sockets)					
Mechanical Life Operations		10×10^6					
Switching Frequency Operations		1800/Hr					
Timing	Duty Cycle	Continuous					
Repeat Accuracy ❸ Adjustable Time Setting		±1% ±33 ms ±5%			Factory Fixed Repeat Cycle Within +5%		
Timing Change		±10%					
Scale Tolerance	High End of Range	–0…+40%					
	Low End of Range	+0…–40%					
Reset Time		100 ms					
Timing Range		0.1…10 s 1.0…180 s 2.0…30 min.			Cycle: ON = OFF or ON ≠ OFF Fixed ON: 0.1…600 s Fixed OFF: 0.1…600 s		
Time Functions		—			—		
Coil Voltages		See Product Selection					
Environmental							
Temperature	Operating	–30…+55°C (–22…+131°F)					
	Storage	–55…+85°C (–67…+185°F)					
Altitude		2000 m (6560 ft.)					
Construction							
Insulating Material		Molded High Dielectric Material					
Enclosure		Impact Resistant Dust Cover					
Contact Material		Silver Cadmium Oxide					
Terminal Markings on Socket		In accordance with EN50 0005					
Sockets		8-Pin Socket Cat. No. 700-HN100, -HN125					
Certifications		CSA Certified, File LR41729; UL Recognized, File E3125; Guide NLDX 2; CE Marked (per EU Low Voltage Directive 73/23 EEC 93/68 EEC)					
Standards		EN 60947-4-1; EN 60947-5-1; IEC 947; CSA 22.2; UL 508					

❶ Performance Data — See page Important-2, Publication A113.
❷ NEMA Rating Chart is on page 19.
❸ At constant voltage and temperature.

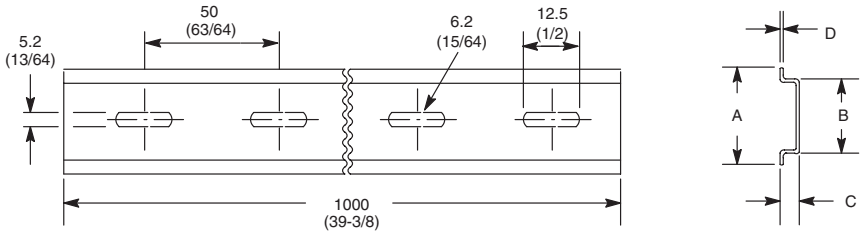
Plug-in Timing Relays

Approximate Dimensions

Approximate Dimensions are shown in millimeters (inches). Approximate Dimensions are not intended to be used for manufacturing purposes.

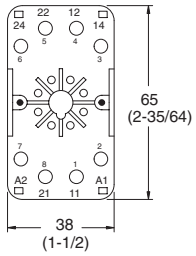


Bulletin 700-HV Timing Relay
(Bulletin 700-HVF without knobs)

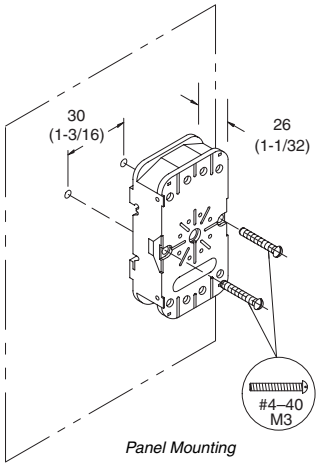


Cat. No. 199-DR1 DIN Mounting Rail Series B
Cat. No. 199-DR4 DIN Mounting Rail Series B Has No Mounting Holes

Cat. No.	A	B	C	D	Approx. Shipping Wt.
199-DR1	35 (1-3/8)	27 (1-1/16)	7.5 (19/64)	1.02 (1/64)	1.85 kg (4.07 lbs.) (10/pkg)
199-DR4	35 (1-3/8)	27 (1-1/16)	15 (19/32)	2.3 (3/32)	3.68 kg (8 lbs.) (5/pkg)

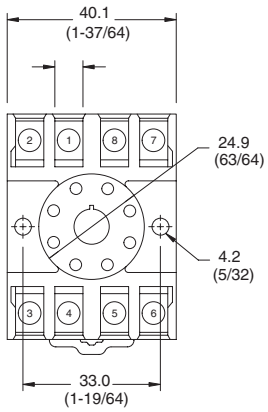


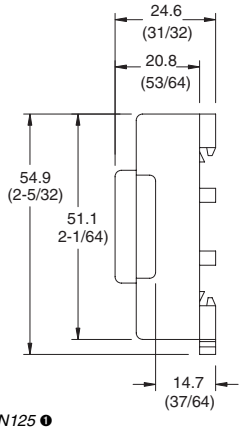
Cat. No. 700-HN100



Panel Mounting

Wire Size: 2 x 2.5 mm²
Single Wire — Up to #12 AWG
Double Wire — 2 x 2.5 mm² (#2 – 14 AWG…#2 – 20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in.) – Torque: 0.8 N•m (7 lb.-in.)





Cat. No. 700-HN125 ❶

Wire Size: 2 x 2.5 mm²
Single Wire — Up to #12 AWG
Double Wire — 2 x 2.5 mm² (#2 – 14 AWG…#2 – 20 AWG)
(Either Solid or Stranded)
Strip Length: 9 mm (3/8 in.) – Torque: 0.8 N•m (7 lb.-in.)

❶ Cat. No. 199-FSM Surge Suppressors fit on the coil terminals. See page 187.

Bulletin 700-HX

- Digital Timing Relay with LCD Display
- Socket or Panel Mounted (NEMA 4/ IP66)
- 5A, B300, SPDT Contact Ratings
- 10 Functions or Modes
- Environmentally Friendly — Flash Memory, No Battery
- User Manual 700-UM002A-EN-D Available at http://www.theautomationbookstore.com

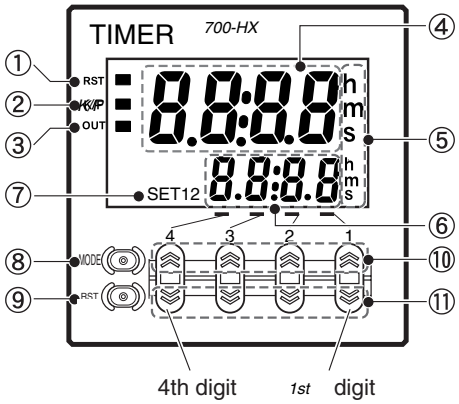
Table Of Contents

Product Selection 165
Accessories 166
Specifications 167
Approximate Dimensions 173

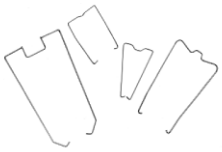
Model	Output Modes	Timing Ranges	Sockets	Output	Pins	Input Voltage	Cat. No.	Factory-stocked Item
Cat. No. 700-HX…	A mode: Signal ON-Delay 1 A-1 mode: Signal ON-Delay 2 A-2 mode: Power ON-Delay 1 A-3 mode: Power On-Delay 2 B mode: Repeat Cycle 1 B-1 mode: Repeat Cycle 2 D mode: Signal OFF-delay E mode: One Shot F mode: Cumulative Twin Timer	0.000…9.999 s 0.000…99.99 s 0.000…999.9 s 0.000…9999 s 0.000…99 min. 59 s 0.000…999.9 min. 0.000…9999 min. 0.000…99 h 59 min. 0.000…999.9 h 0.000…9999 h	700-HN100 700-HN125	SPDT	8	100… 240V AC	700-HX86SA17	✔
						24V AC 12…24V DC	700-HX86SU24	✔

General Timer Functions

① Reset indicator
② Key protect indicator (Orange)
③ Output indicator (Orange)
④ Present value (11.5-mm character height, Red)
⑤ Time unit display (Orange)
⑥ Set value (6-mm character height, Green)
⑦ Set Values 1 and 2 display



⑧ Mode key
Mode conversion and switching of setting items are carried out.
⑨ Reset key
⑩ Up key
⑪ Down key

	Description	Pkg. Qty.	Cat. No.	Factory-stocked Item
Cat. No. 700-HN100	**Screw Terminal Tube Base Sockets — Panel or DIN Rail Mounting Guarded Terminal Construction** 8-pin for use with Bulletin 700-HX timing relays. Order must be for 10 sockets or multiples of 10.	10	700-HN100	✔
Cat. No. 700-HN125	**Screw Terminal Tube Base Sockets — Panel or DIN Rail Mounting Open Style Construction** 8-pin for use with Bulletin 700-HX timing relays. Order must be for 10 sockets or multiples of 10. No retainer clip required.	10	700-HN125	✔
Cat. No. 199-DR1	**DIN Rail Mounting Pack** Standard 35 x 7.5 mm DIN Rail, 1 meter long, 10 rails per package. Order must be for 10 rails or multiples of 10.	10	199-DR1	✔
Cat. No. 700-HN108	**Specialty Socket** 8-pin backwired socket with solder terminals for use with Bulletin 700-H timing relays. Order must be for 10 sockets or multiples of 10.	10	700-HN108	✔
 *Sample Retainer Clips*	**Retainer Clip for Cat. No. 700-HN100 Socket with all 700-HR and 700-HX Timing Relay** Secures timer in socket. Order must be for 10 clips or multiples of 10. Note: Not required for installation	10	700-HN131	✔
Cat. No. 700-HN130	**Frame Adapter** For flush or door mounting of all Bulletin 700-HR and -HX timers.	1	700-HN130	✔
Cat. No. 700-HN132	**Protective Cover** Helps prevent tampering of timing and mode settings. Provides a degree of protection against water and dirt from entering the front of the relay. For use with all Bulletin 700-HRs and -HX timing relays.	1	700-HN132	✔

Timing Relay, Socket, Retainer Clip Reference Chart

Timer Type	Socket Cat. No.	Retainer Clip Cat. No.
700-HX	700-HN100	Not Required ❶
	700-HN108	Not Required ❶
	700-HN125	Not Required ❶

❶ Design of socket holds the relay securely and does not require retainer clips.

Electrical Ratings		
Pilot Duty Rating		NEMA B300
Rated supply voltage		100 to 240V AC, 24V AC/12 to 24V DC (50/60Hz) (permissible ripple: 20%(p-p) max.)
Operating voltage range		85%…110% of rated supply voltage
Power consumption	100…240V AC	4.3 VA
	24V AC/12…24V DC	3.4 VA/1.7 W
Inrush Current	100…240V AC	3 A
	24V AC/12…24V DC	5 A
►][◄ 120V AC		30 A
Make 240V AC		15 A
◄][► 120V AC		3 A
Break 240V AC		1.5 A
Hp at 120V AC		1/4 Hp
Hp at 240V AC		1/3 Hp
Mechanical		
Mounting method		Flush mounting, surface mounting, DIN mounting
Display		7-segment, negative transmissive LCD; Present value (red, 8 mm high characters); Set value (green, 4 mm high characters)
Digits		4 digits
Timer	Output modes	N, F, C, or K
	Time ranges	0.000…9.999 s, 0.00…99.99 s, 0.0…999.9 s, 0…9999 s, 0 min. 00 s…99 min. 59 s, 0.0…999.9 min., 0 h 00 min.…99 h 59 min., 0.0 h…999.9 h, 0 h…9999 h
	Timer modes	Elapsed time (Up), remaining time (Down), selectable
	Output modes	A, A-1, A-2, A-3, B, B-1, D, E, F, Z, ton or toff
Inputs	Input signals	Start, reset
	Input method	No-voltage input via:NPN transistor or switching of contact
	Start, reset, gate	Minimum input signal width: 1 or 20 ms (selectable)
	Power reset	Minimum power-opening time: 0.5 s (Except for A-3, B-1, and F mode)
Control output		SPDT contact output: 5 A at 250V AC, resistive load (cosine=1) Minimum applied load: 10 mA at 5 V DC (failure level: P, reference value)
External Power Supply		No
Key Protect		Yes
Memory backup		EEP-ROM (overwritten 200,000 times min.), which can store data for 20 years min.
Accuracy of Operating Time and Setting Error ❶		Power-ON start: +-0.01% +-50 ms max. * to be rated against set value Signal start: +- 0.005 +-30 ms max. * to be rated against set value Signal start at transistor output model: +- 0.005% +-3 ms max. ❷ If the set value is within the sensor waiting time (250 ms max.)

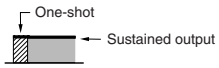
❶ The values are based on the set value.
❷ The value is applied for a minimum pulse width of 1 ms.

Specifications, Continued

Characteristics ❶		
Insulation resistance		100 MΩ min. (at 500V DC)
Dielectric strength		2000V AC, 50/60Hz for 1 min. between current-carrying terminals and non-current-carrying metal parts (1000V AC for 24V AC/12 to 24V DC type), 1000 VAC, 50/60 Hz for 1 min. between non-continuous contacts
Noise immunity		'+-1.5 kV (between power terminals) for 100 to 240 VAC, +-480V for 24VAC/12 to 24VDC, and +-600V (between input terminals), square-wave noise by noise simulator (pulse width: 100 ns/1 µs, 1-ns rise)
Static immunity		±8 kV (malfunction), ±15 kV (destruction)
Vibration resistance	Malfunction	10…55 Hz with 0.35 mm single amplitude each in three directions for 10 min.
Shock resistance	Malfunction	98 m/s² (approx. 10 G) each in three directions
Life expectancy	Mechanical	10 million operations min.
	Electrical	100,000 operations min. (5 A at 250V AC, resistive load)
EMC		(EMI) EN61326 Emission Enclosure: EN55011 Group1 class A Emission AC mains: EN55011 Group1 class A (EMS) EN61326 Immunity ESD: EN61000-4-2: 4 kV contact discharge (level2) 8 kV air discharge (level3) Immunity RF-interference: EN61000-4-3: 10 V/m
Approved standards		UL508, CSA C22.2 No.14 Conforms to EN61010-1/IEC61010-1 (Pollution degree 2/overvoltage category II) Conforms to VDE0106/P 100 (Finger Protection), conforms to NEMA output rating (N/F)
Enclosure ratings		Panel surface:IP66 and NEMA Type 4 (indoors) ❷
Weight		Approx. 100 g
Certifications		CE Certified; UL508; CSA, C22.2 No. 14; ACA
Standards		EN61010-1; IEC61010-1; VDE0106/P 100; NEMA 4/ IP66

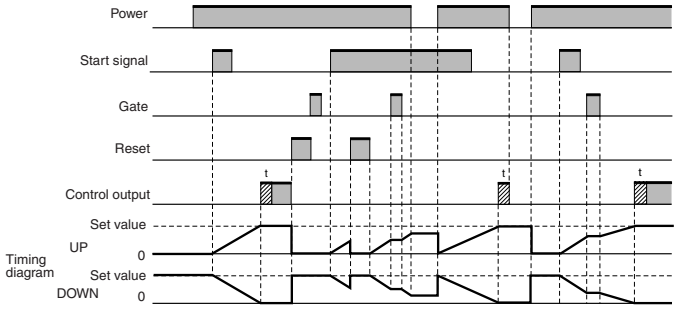
❶ 700-HX User Manual, pub. number 700-UM002A-EN-D, available at: http://www.theautomationbookstore.com.
❷ An attached waterproof packing is necessary to ensure IP66 waterproofing between the 700-HX and installation pan.

Timing Charts



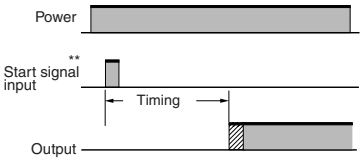
One-shot outputs can be to set to 0.1 s, 0.5 s, 1s, 5 s, 10 s, 20 s.

Output mode A Mode: Signal ON-Delay (Timer resets when power comes ON.)



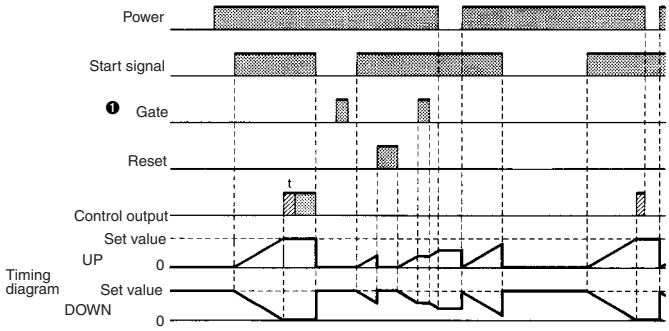
Timing starts when the start signal goes ON.
While the start signal is ON, the timer starts when power comes ON or when the reset input goes OFF.
The control output is controlled using a sustained or one-shot rime period.

Basic Operation



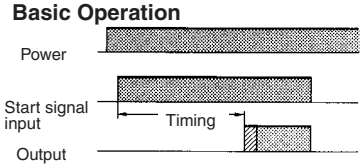
* Output is instantaneous when setting is 0.
** Start signal input is enabled during timing.

Output Mode A-1: Signal ON-Delay 2 (Timer resets when power comes ON.)



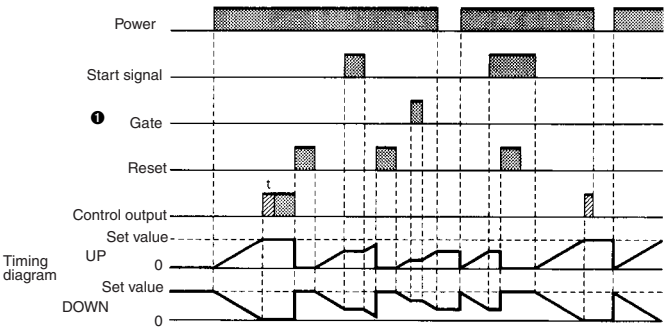
Timing starts when the start signal goes ON, and is reset when the start signal goes OFF.
While the start signal is ON, the timer starts when the power comes ON or when the reset input goes OFF.
The control output is controlled using a sustained or one-shot time period.

Basic Operation



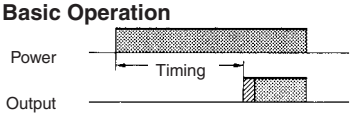
*Output is instantaneous when setting is 0.

Output mode A-2: Power ON Delay 1 (Timer resets when power comes ON)



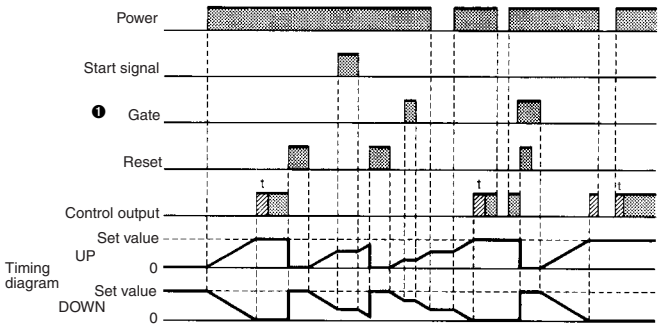
Timing starts when the reset input goes OFF.
The start signal disables the timing function (i.e., same function as the gate input).
The control output is controlled using a sustained or one-shot time period.

Basic Operation



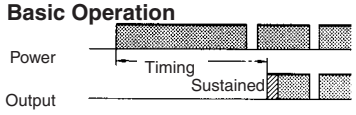
*Output is instantaneous when setting is 0.

Output mode A-3 Power ON Delay 2 (Timer does not reset when power comes ON)



Timing starts when the reset input goes OFF.
The start signal disables the timing function (i.e., same function as the gate input).
The control output is controlled using a sustained or one-shot time period.

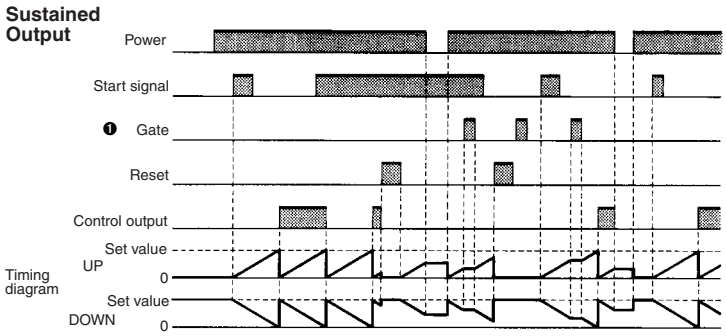
Basic Operation



*Output is instantaneous when setting is 0.

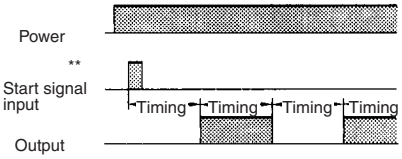
❶ Gate not included.

Output mode B: Repeat Cycle (Timer resets when power comes ON.)

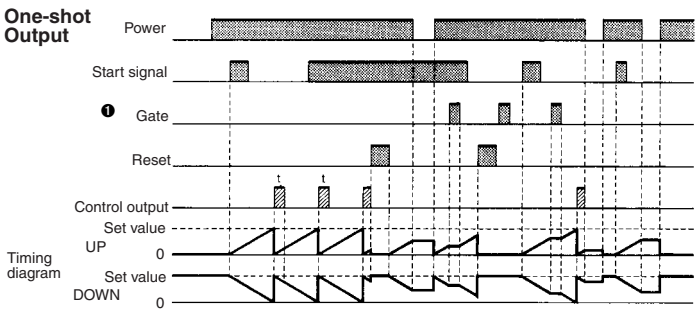


Timing starts when the start signal goes ON.
The status of the control output is reversed when time is up (OFF at start).
While the start signal is ON, the timer starts when the power comes ON or when the reset input goes OFF.

Basic Operation

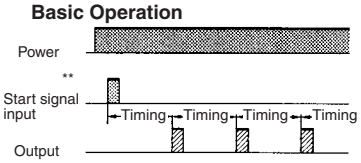


* Normal output operation will not be possible if the set time is too short.
Set the value to at least 100 ms (contact output type).
** Start signal input is disabled during timing.



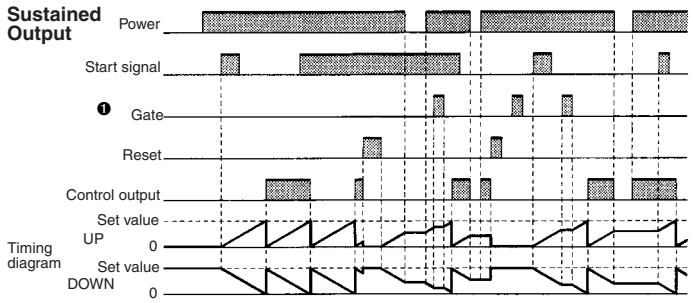
Timing starts when the start signal goes ON.
The control output is turned ON when time is up.
While the start signal is ON, the timer starts when the power comes ON or when the reset input goes OFF.

Basic Operation



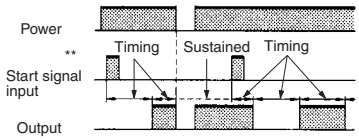
* Normal output operation will not be possible if the set time is too short.
Set the value to at least 100 ms (contact output type).
** Start signal input is disabled during timing.

Output Mode B-1: Repeat Cycle 2 (Timer does not reset when power comes ON)

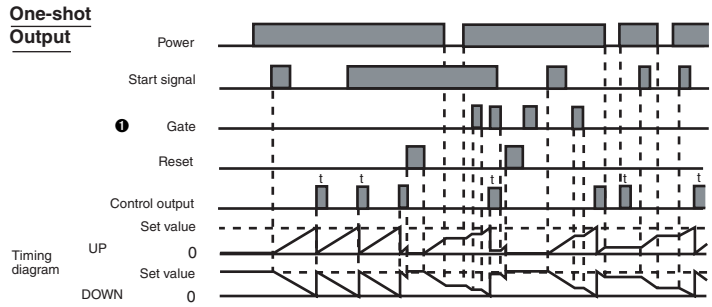


Timing starts when the start signal goes ON.
The status of the control output is reversed when time is up (OFF at start).
While the start signal is ON, the timer starts when the power comes ON or when the reset input goes OFF.

Basic Operation

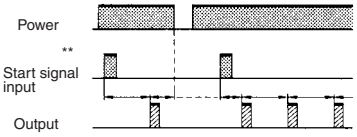


* Normal output operation will not be possible if the set time is too short.
Set the value to at least 100 ms (contact output type).
** Start signal input is disabled during timing.



Timing starts when the start signal goes ON.
The control output comes ON when time is up..
While the start signal is ON, the timer starts when power comes ON or when the reset input goes OFF.

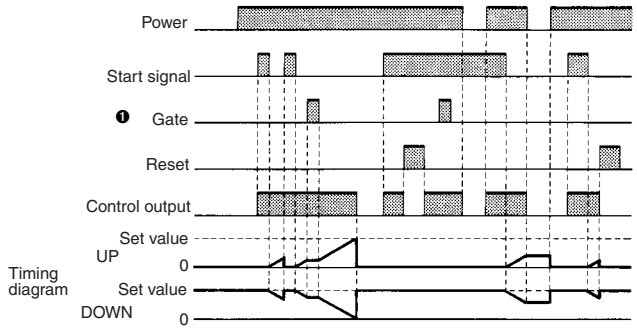
Basic Operation



* Normal output operation will not be possible if the set time is too short.
Set the value to at least 100 ms (contact output type).
** Start signal input is disabled during timing.

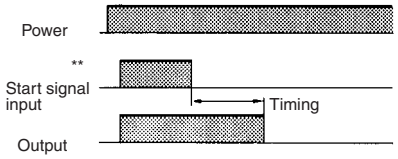
❶ Gate not included.

Output mode D: Signal OFF-delay (Timer resets when power comes ON.)



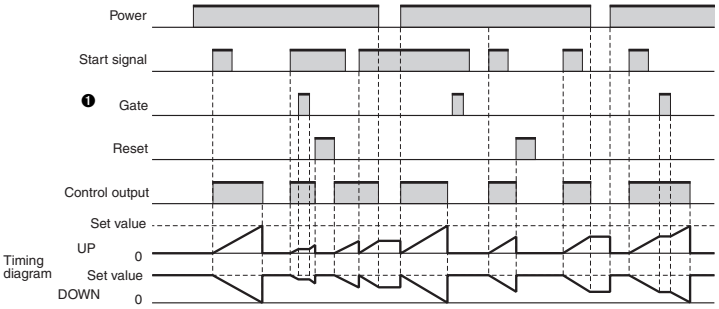
The control output is ON when the start signal is ON (except when the power is OFF or the reset is ON).
The timer is reset when the time is up.

Basic Operation



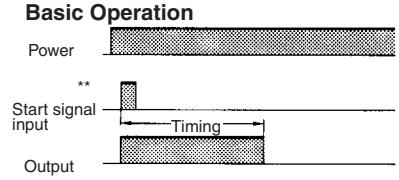
* Output functions only during start signal input when setting is 0.
** Start signal input is enabled during timing.

Output mode E: Interval (Timer resets when power comes ON.)



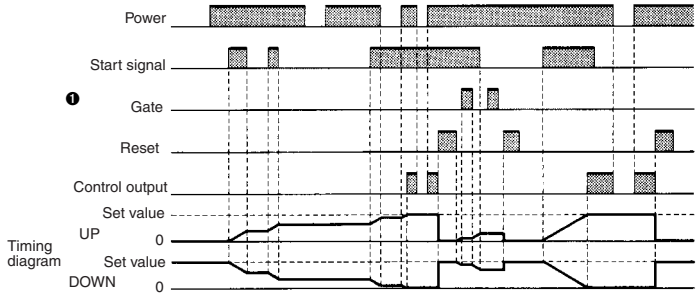
Timing starts when the start signal comes ON.
The control output is reset when time is up.
While the start signal is ON, the timer starts when power comes ON or when the reset input goes OFF.

Basic Operation



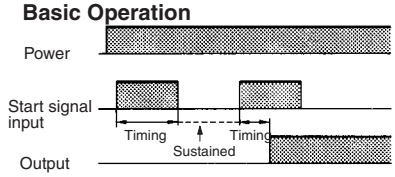
* Output is disabled when the setting is 0.
** Start signal input is enabled during timing.

Output Mode F: Cumulative (Timer does not reset when power comes ON)



Start signal enables timing (timing is stopped when the start signal is OFF or when the power is OFF).
A sustained control output is used.

Basic Operation



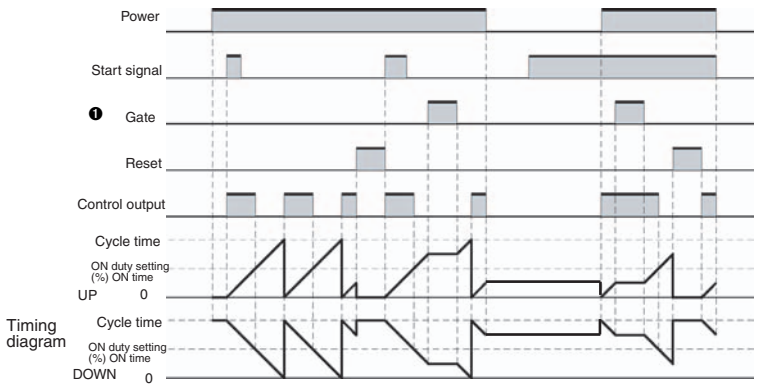
*Output is instantaneous when setting is 0.

❶ Gate not included.

Z Mode

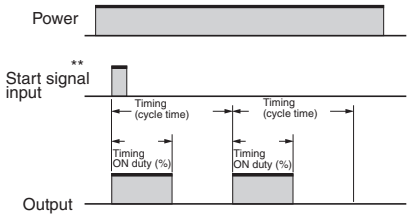
Output quantity can be adjusted by changing the cycle time set in the adjustment level to 1 and by changing the ON duty (%) set value. The set value shows the ON duty (%) and can be set to a value between 0 and 100 (%). When the cycle time is 0, the output will always be OFF. When the cycle time is not 0 and when ON duty has been set to 0 (%), the output will always be OFF. When ON duty has been set to 100 (%), the output will always be ON.

Z mode: ON/OFF-duty Adjustable Repeat Cycle



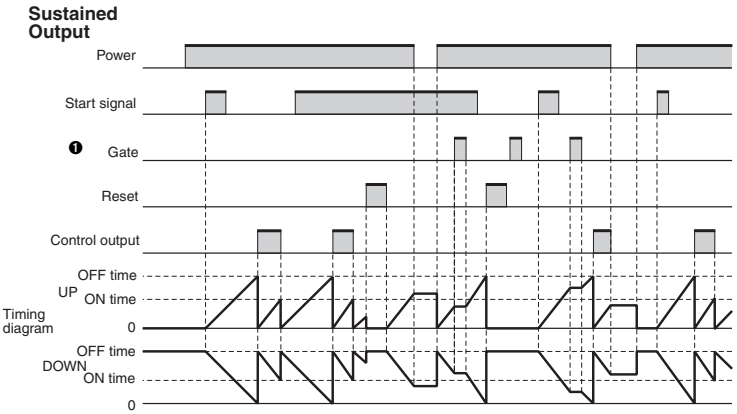
Timing starts when the start signal goes ON.
The status of the control output is reversed when time is up (ON at start).
While the start signal is ON, the timer starts when power comes ON or when the reset input goes OFF.

Basic Operation



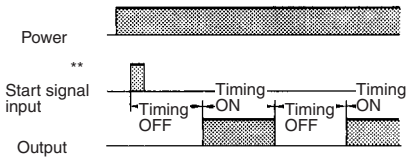
* Normal output operation will not be possible if the set time is too short.
Set the value to at least 100 ms (contact output type).
** Start signal input is enabled during timing.

Output mode T OFF: Twin Timer OFF start



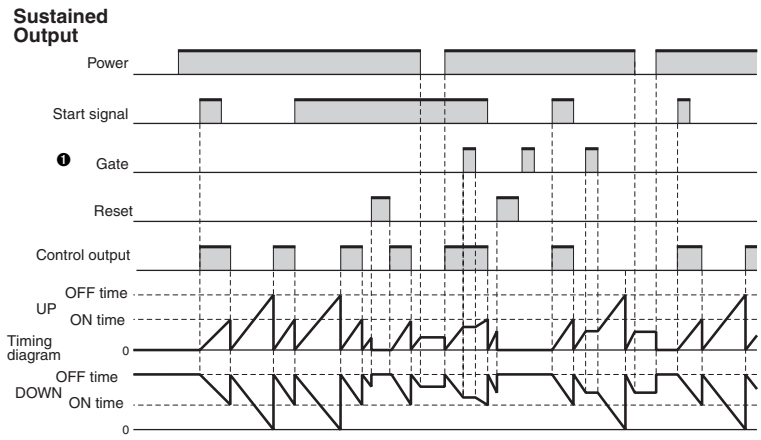
Timing starts when the start signal goes ON.
The status of the control output is reversed when time is up (OFF at start).
While the start signal is ON, the timer starts when the power comes ON or when the reset input goes OFF.

Basic Operation



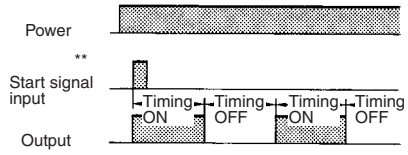
* Normal output operation will not be possible if the ON/OFF set time is too short.
Set the value to at least 100 ms (contact output type).
** Start signal input is disabled during timing.

Output mode T ON: Twin Timer ON start



Timing starts when the start signal goes ON.
The status of the control output is reversed when time is up (ON at start).
While the start signal is ON, the timer starts when the power comes ON or when the reset input goes OFF.

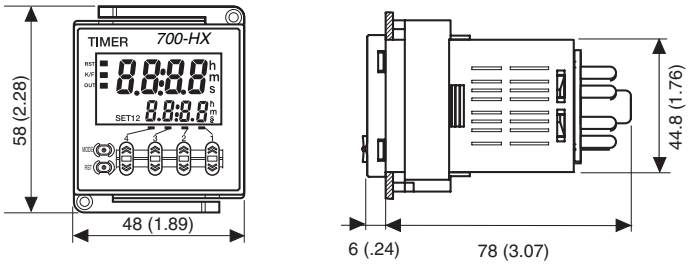
Basic Operation



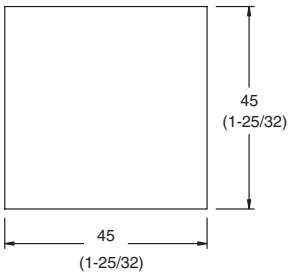
* Normal output operation will not be possible if the ON/OFF set time is too short.
Set the value to at least 100 ms (contact output type).
** Start signal input is disabled during timing.

❶ Gate not included

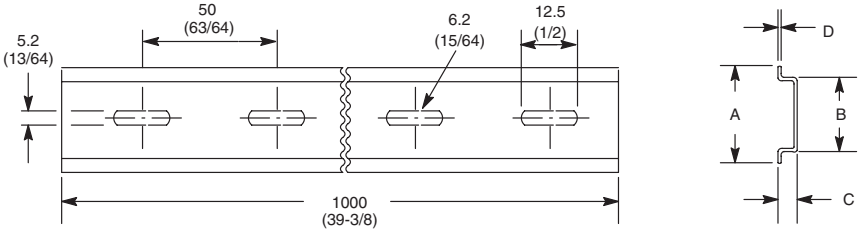
Approximate Dimensions are shown in millimeters (inches). Approximate Dimensions are not intended to be used for manufacturing purposes.



Cat. No. 700-HX…

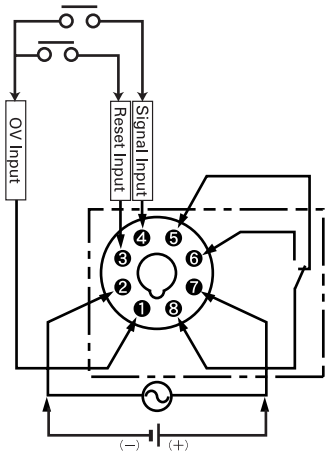


Cat. No. 700-HX…
Panel Cutout



Cat. No. 199-DR1 DIN Mounting Rail Series B
Cat. No. 199-DR4 ***DIN Mounting Rail Series B Has No Mounting Holes***

Terminal Arrangement



Cat. No. 700-HX…

Bulletin 700-HXM

- One of the World's Smallest Preset Digital Timers
- Panel Mounted (1/32 DIN Cut Out)
- Built-in Prescaling for Counter Operation
- Finger Protection Terminal Block (VDE0106/P100)
- NEMA 4 / IP66
- User Manual 700-UM001A-EN-D Available at http://www.theautomationbookstore.com

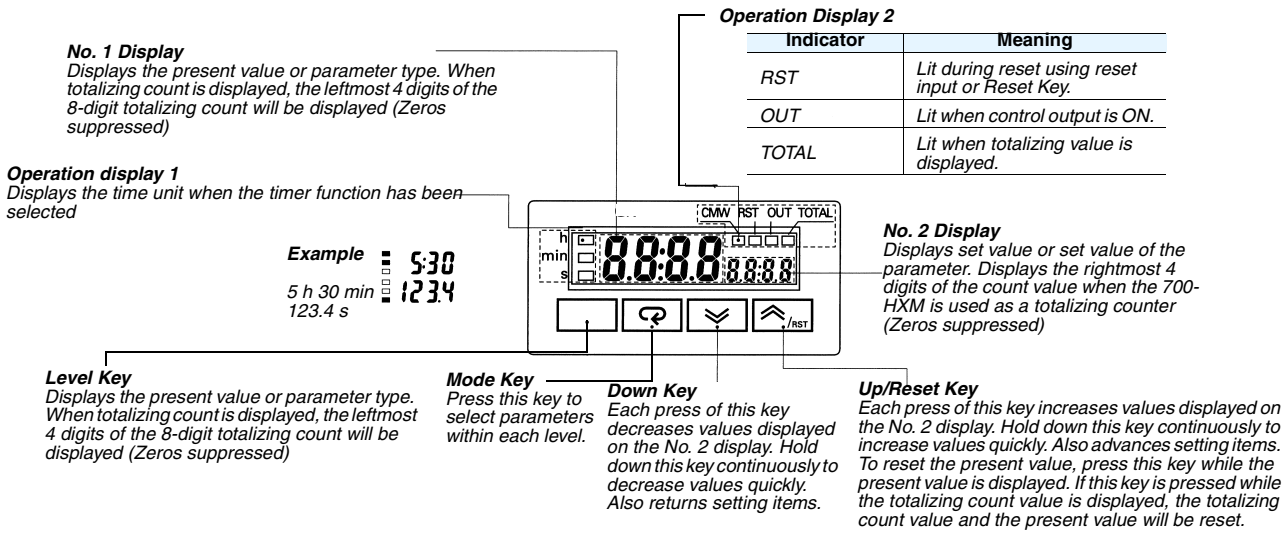
Table Of Contents

Product Selection 174
Accessories 175
Specifications 176
Approximate Dimensions 181

Model	Timer Modes	Counter Modes ❶		Timing Range	Counter Range	Input Voltage	Cat. No.	Factory-stocked Item
		Input	Output					
Cat. No 700-HXM...	A mode: Signal ON-delay B mode: Repeat Cycle D mode: Signal OFF-delay E mode: One Shot F mode: Accumulative Z mode: ON/OFF-duty Adjustable Repeat Cycle	Increment Decrement Individual Quadrature	N,F,C,K	0.000…9999 h	-999…9999	24V DC	700-HXM66SZ24	✔

❶ For counter mode explanation, see page 178.

General Timer Functions


Operation Display 2
Indicator
Meaning
RST
Lit during reset using reset input or Reset Key.
OUT
Lit when control output is ON.
TOTAL
Lit when totalizing value is displayed.
No. 1 Display
Displays the present value or parameter type. When totalizing count is displayed, the leftmost 4 digits of the 8-digit totalizing count will be displayed (Zeros suppressed)
Operation display 1
Displays the time unit when the timer function has been selected
Example
5 h 30 min
123.4 s
5:30
123.4
CMW RST OUT TOTAL
h
min
s
No. 2 Display
Displays set value or set value of the parameter. Displays the rightmost 4 digits of the count value when the 700-HXM is used as a totalizing counter (Zeros suppressed)
Level Key
Displays the present value or parameter type. When totalizing count is displayed, the leftmost 4 digits of the 8-digit totalizing count will be displayed (Zeros suppressed)
Mode Key
Press this key to select parameters within each level.
Down Key
Each press of this key decreases values displayed on the No. 2 display. Hold down this key continuously to decrease values quickly. Also returns setting items.
Up/Reset Key
Each press of this key increases values displayed on the No. 2 display. Hold down this key continuously to increase values quickly. Also advances setting items. To reset the present value, press this key while the present value is displayed. If this key is pressed while the totalizing count value is displayed, the totalizing count value and the present value will be reset.

	Description	Pkg. Qty.	Cat. No.	Factory-stocked Item
Cat. No. 700-HN141	**Replacement Flush Mounting Adapter** (One shipped with each 700-HXM66Z24)	1	700-HN141	✔

Specifications ❶ ❷

Electrical Ratings		
Pilot Duty Rating		NEMA B300
Rated supply voltage		24 VDC
Operating voltage range		85%…110% of rated supply voltage
Power consumption		1.5 W max. (for max. DC load) (Inrush current: 15 A max.)
►][◄ Make	120V AC	30 A
	240V AC	15 A
◄][► Break	120V AC	3 A
	240V AC	1.5 A
Hp at 120V AC		1/4 Hp
Hp at 240V AC		1/3 Hp
Mechanical		
Mounting method		Flush mounting (Panel or door)
Terminal screw tightening torque		0.5 N•m max.
Display		7-segment, negative transmissive LCD; time display (h, min., s); CMW, OUT, RST, TOTAL Present value (red, 7 mm high characters); Set value (green, 3.4 mm high characters)
Digits		PV: 4 digits SV: 4 digits When total count value is displayed: 8 digits (Zeros suppressed)
Memory backup		EEPROM (non-volatile memory) (number of writes: 100,000 times)
Counter	Maximum counting speed	30 Hz or 5 kHz ❶
	Counting range	-999…9,999
	Input modes	Increment, decrement, individual, quadrature inputs
	Output modes	N, F, C, or K
Timer	Time ranges	0.000…9.999 s, 0.00…99.99 s, 0.0…999.9 s, 0…9999 s, 0 min. 00 s…99 min. 59 s, 0.0…999.9 min., 0 h 00 min.…99 h 59 min., 0.0 h…999.9 h, 0 h…9999 h
	Timer modes	Elapsed time (Up), remaining time (Down)
	Output modes	A, B, D, E, F, or Z
Inputs (OV input)	Input signals	For Counter:CP1, CP2, and reset For Timer:Start, gate, and reset
	Input method	No-voltage input (contact short-circuit and open input) Short-circuit (ON) impedance: 1 KΩ max. (Approx. 2 mA runoff current at 0Ω) Short-circuit (ON) residual voltage: 2V DC max. Open (OFF) impedance: 100 kΩ min. Applied voltage: 30V DC max.
	Start, reset, gate	Minimum input signal width: 1 or 20 ms (selectable)
	Power reset	Minimum power-opening time: 0.5 s
Control output		SPDT contact output: 5 A at 250V AC/30V DC, resistive load (cos ϕ = 1)
Minimum applied load		10 mA at 5 VDC (failure level: P, reference value)
Reset system		External, manual, and power supply resets (for timer in A, B, D, E, or Z modes)
Sensor waiting time		260 ms max. (Inputs cannot be received during sensor wait time if control outputs are turned OFF.)

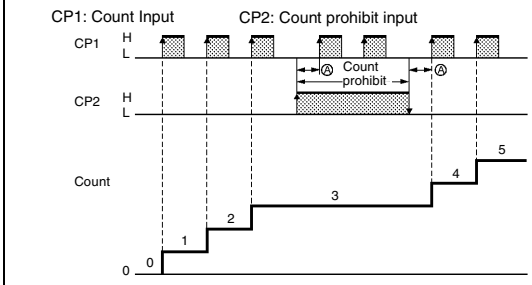
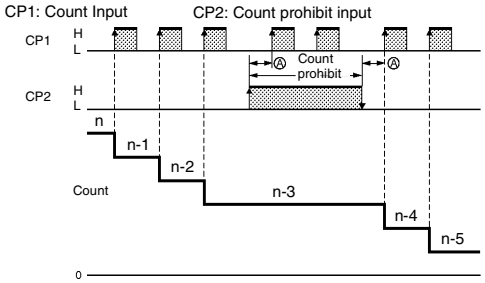
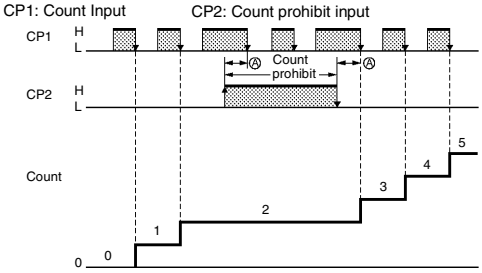
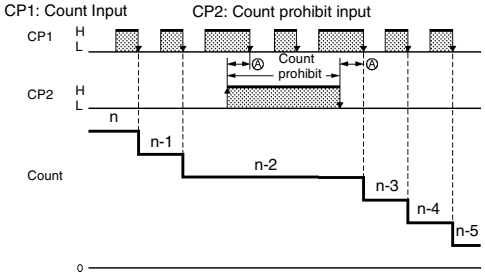
❶ The figures given for maximum counting speed are for incrementing or decrementing operation with a prescale value of x1. If prescaling is used and 5 kHz is set, the maximum counting speed will be reduced to about half. The non-prescaling maximum counting speed will also be reduced to about half when the up/down mode is selected.

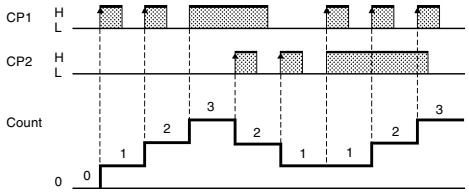
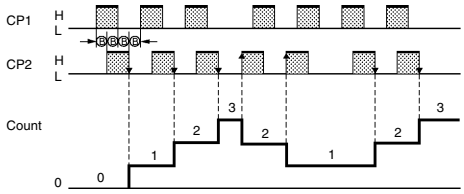
❷ "700-HXM User Manual" pub. no. 700-UM001A-EN-D, available at: http://www.theautomationbookstore.com.

Characteristics		
Timer function		Signal start: ±0.03% ±30 ms max. Power-ON start: ±0.03% ±50 ms max.
Insulation resistance		100 MΩ min. (at 500V DC)
Dielectric strength		1,500V AC, 50/60 Hz for 1 min. between output terminals and non-current-carrying metal parts 510V AC, 50/60 Hz for 1 min. between current-carrying terminals (except output terminals) and non-current-carrying metal parts 1,500V AC, 50/60 Hz for 1 min. between output terminals and current-carrying terminals (except output terminals) 500V AC, 50/60 Hz for 1 min. between communications terminals and current-carrying terminals (except output terminals) 1,000V AC, 50/60 Hz for 1 min. between contacts not located next to each other
Noise immunity		Square-wave noise by noise simulator; ±480V (between power terminals), ±600 V (between input terminals)
Static immunity		±8 kV (malfunction), ±15 kV (destruction)
Vibration resistance	Malfunction	10…55 Hz with 0.35 mm single amplitude each in three directions for 10 min.
Shock resistance	Malfunction	100 m/s² (approx. 10 G), 3 times each in six directions
Life expectancy	Mechanical	10 million operations
	Electrical	100,000 operations min. (3 A at 250V AC, resistive load)
Ambient temperature	Operating	-10°C…55°C (with no icing or condensation)
	Storage	-25°C…65°C (with no icing or condensation)
Ambient humidity		25%…85%
EMC		(EMI): Emission Enclosure: EN61326 Class A (EMS):EN61326 Immunity ESD:EN61000-4-2:4 kV contact discharge (level 2) 8 kV air discharge (level 3) Immunity RF-interference:EN61000-4-3:10 V/m (Amplitude-modulated, 80 MHz…1 GHz) (level 3); 10 V/m (Pulse-modulated, 900 MHz ±5 MHz) (level 3) Immunity Conducted Disturbance:EN61000-4-6:3 V (0.15…80 MHz) (level 2) Immunity Burst:EN61000-4-4:2 kV power-line (level 3); 1 kV I/O signal-line (level 4); 1 kV communications-line (level 3) Immunity Surge:EN61000-4-5:1 kV between lines (power and output lines) (level 3); 2 kV between grounds (power and output lines) (level 3)
Approved standards		UL508, CSA C22.2 No.14 Conforms to EN61010-1/IEC61010-1 (Pollution degree 2/overvoltage category II) Conforms to VDE0106/P 100 (Finger Protection)
Enclosure ratings		Panel surface:IP66 and NEMA Type 4 (indoors) Rear case:IP20 Terminal block:IP20
Weight		Approx. 80 g
Certifications		CE Certified; UL508; CSA C22.2 No. 14; ACA
Standards		EN61010-1; IEC61010-1; VDE0106/P 100; NEMA 4/IP66; VDE0106/P100

Input/Output Modes and Count Values

Note: H = Short-circuited
L = Open

		Up (Increment) Mode ❶	Down (Decrement) Mode ❶
Input edge	UP		
	DOWN		

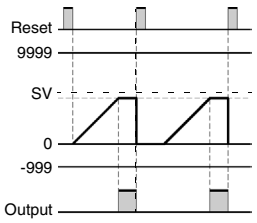
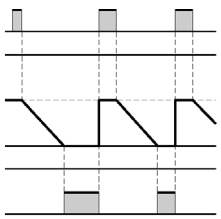
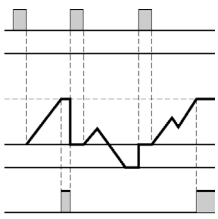
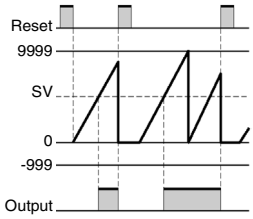
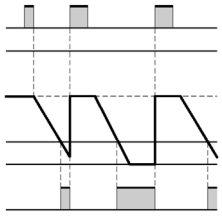
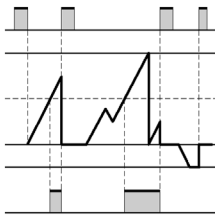
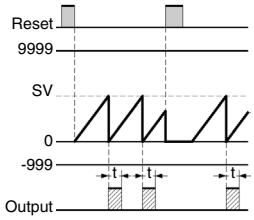
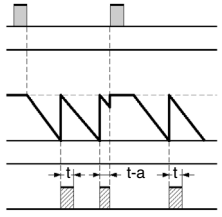
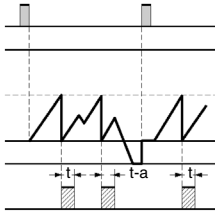
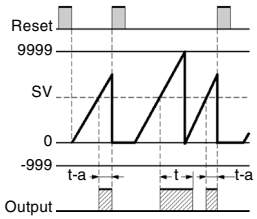
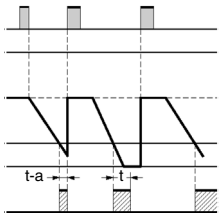
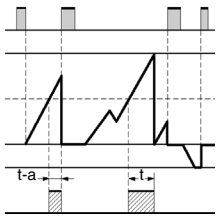
Up/Down B Individual Input	Up/Down C Quadrature Input ❶
	

❶ (A) indicates the minimum signal width and (B) requires at least 1/2 the minimum signal width. If these conditions are not met, a counting error (+1 or -1) may occur.

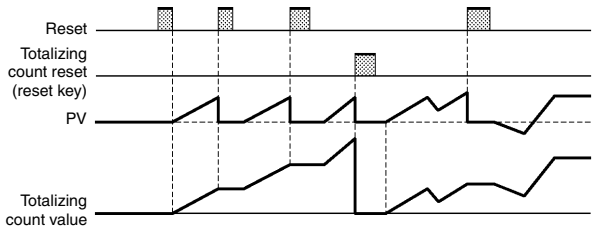
Input/Output Mode Settings

Counter Function

If there is a power failure during output ON, output will turn ON again when the power supply has recovered. For one-shot output, an output will be made again for the duration of the output time setting once the power supply has resumed.
Output timing restarted during one-shot outputs is ignored.
Note: t-a:Less than the output time
t:Output time

		Input Mode		
		Up	**Down**	**Up/Down B.C**
Output mode	N			
	F			
	C			
	K			

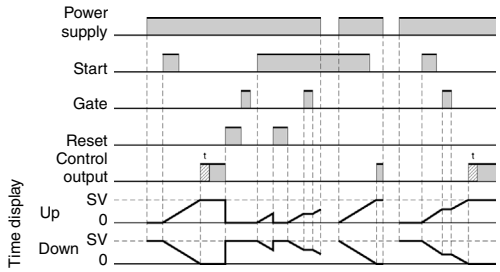
Totalizing Counter Operation



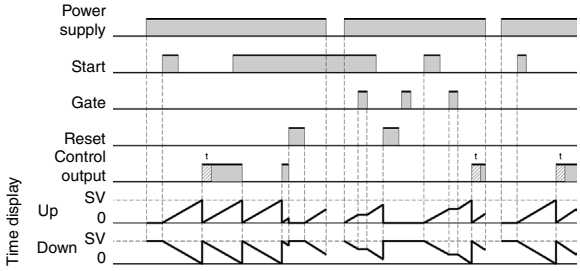
- Totalizing counter continues to count the present value, regardless of whether an reset input (by the reset key) has been made to reset the PV.
- When totalizing count value is reset, the PV is reset at the same time.
- The totalizing count range is 0…99,999,999. If the totalizing count exceeds 99,999,999, the count returns to 0. If the count drops below 0, it becomes 99,999,999.

Timer Function

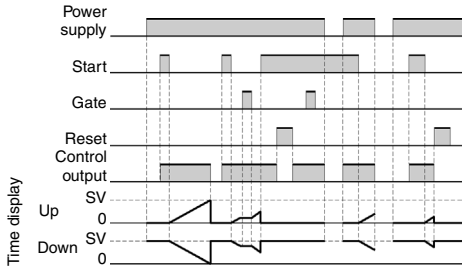
A Mode: Signal ON-Delay ❶



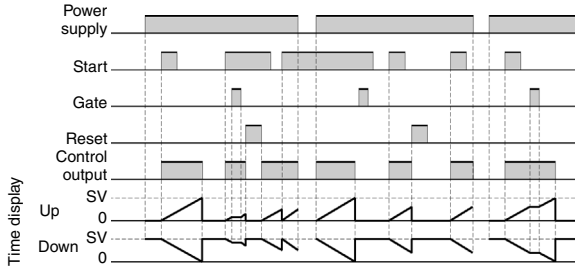
B Mode: Repeat Cycle❶



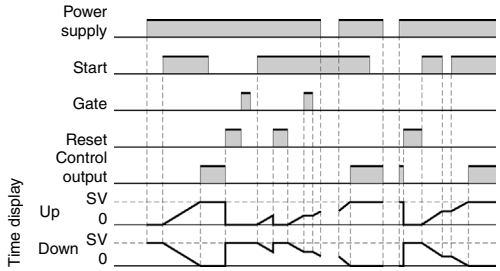
D Mode: Signal OFF-Delay



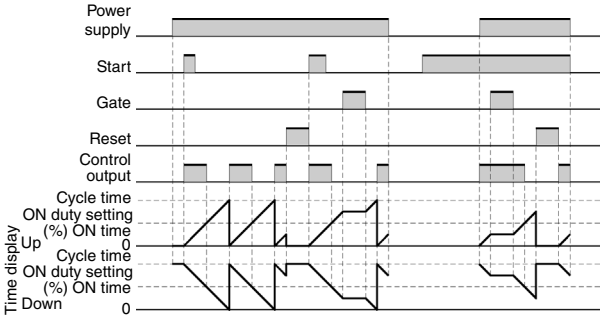
E Mode: One Shot



F Mode: Accumulative

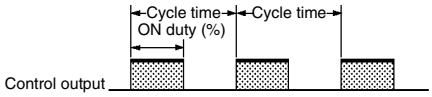


Z Mode: ON/OFF-Duty Adjustable Repeat Cycle



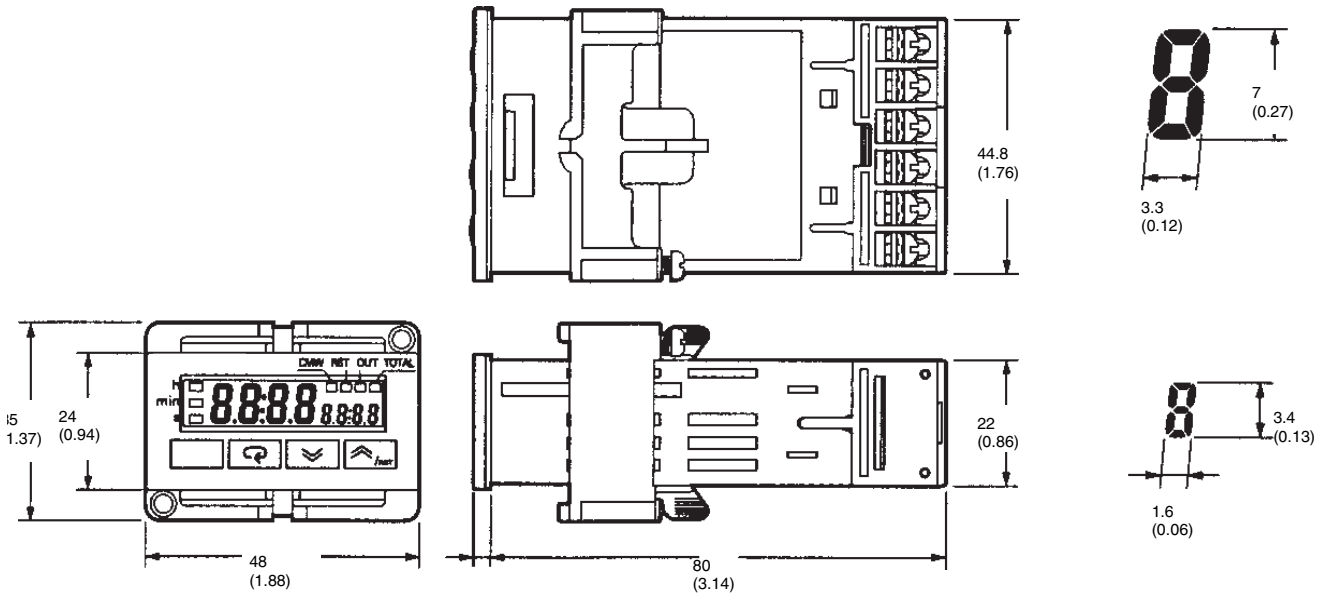
Z Mode

Output quantity can be adjusted by changing the cycle time set in the adjustment level to 1 and by changing the ON duty (%) set value.
The set value shows the ON duty (%) and can be set to a value between 0 and 100 (%). When the cycle time is 0, the output will always be OFF. When the cycle time is not 0 and when ON duty has been set to 0 (%), the output will always be OFF. When ON duty has been set to 100 (%), the output will always be ON.



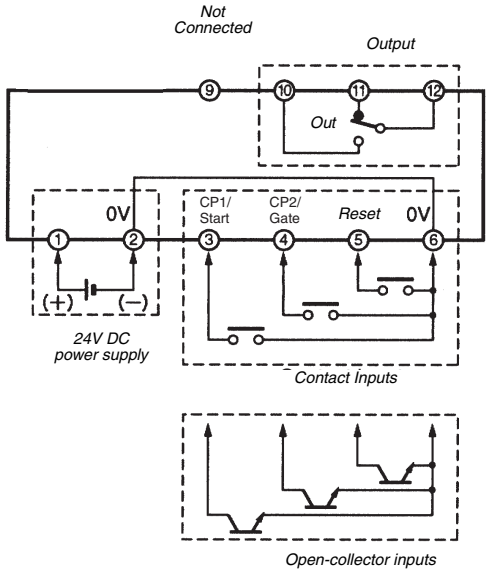
❶ One-shot output or HOLD output can be selected for output:

Approximate Dimensions are shown in millimeters (inches). Approximate Dimensions are not intended to be used for manufacturing purposes.



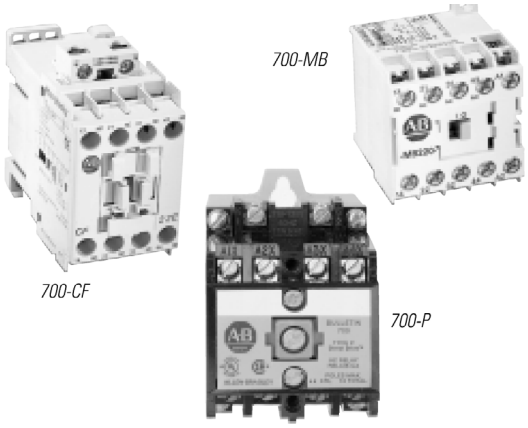
Cat. No. 700-HXM...

Terminal Arrangement



Cat. No. 700-HXM...

Industrial Relays



This portion of the selection guide covers industrial relays. Industrial relays are used for:
- Safety applications
- Applications requiring long life
- Heavy Loads
- Hazardous Areas and Difficult Environments
- Latch and Pneumatic Timers

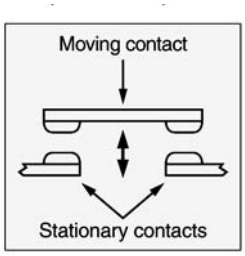
Safety Features

Industrial relays have important features that provide safe, more reliable design of control systems.
- Mechanically linked contacts (positive-guided contacts)
- Double-break contacts make it possible to detect a welded contact and also reduce the possibility of welding a contact.
- Break before make contacts (non-overlapping)

Importance of Mechanically Linked Contacts

This feature allows detection of a welded contact condition. In most relays, each contact opens and closes independently of the other contacts. Mechanically linked (also known as positively guided and Direct Drive™) contacts are linked together, thereby preventing the reclosing of the N.C. contacts if a N.O. contact has welded.

Importance of Double-Break Contacts



This design provides better protection against contact welding than single break design. Other benefits include greater DC load breaking capability and better isolation. It also provides separation of N.O. and N.C. circuits, unlike standard “Form C” contacts. Double-break contacts open the circuit in two places, creating two air gaps. It is analogous to having two contacts in series.

Long Life

Allen-Bradley industrial relays and contacts are designed for long life. Each component is engineered for millions of operations, without compromising performance. Contact life is often 3 to 5 times greater than plug-in relays.

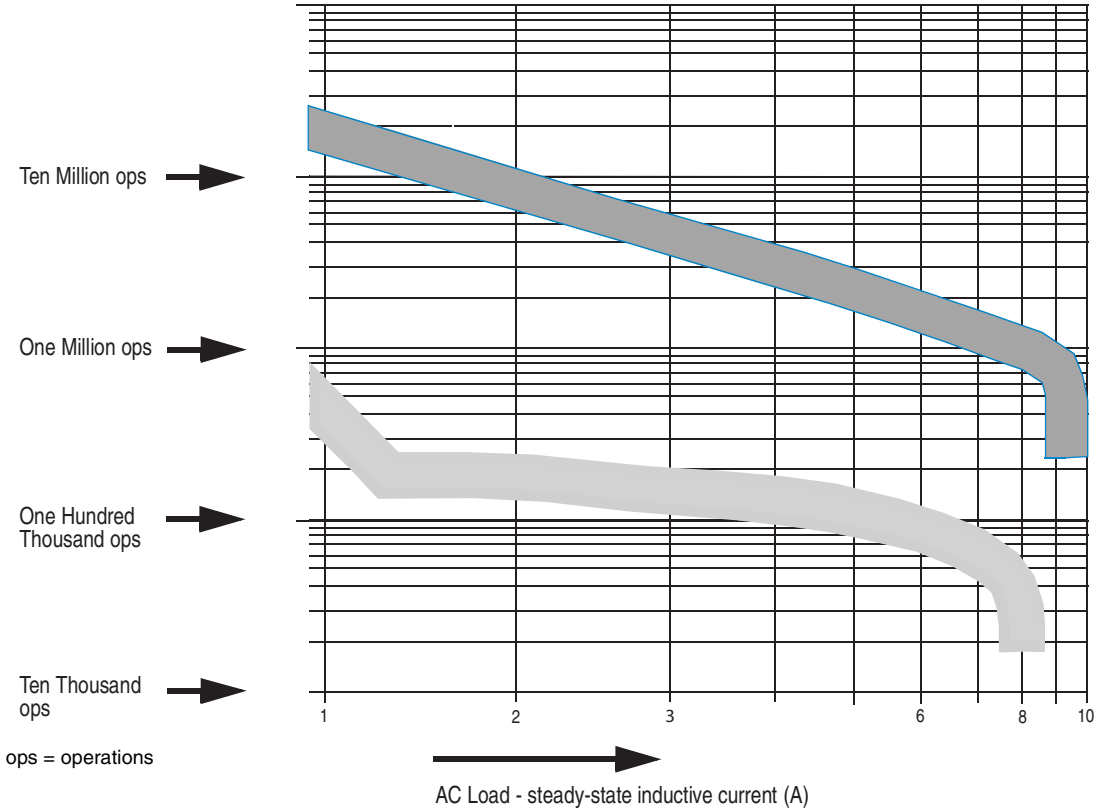
Safety Applications:

Allen-Bradley industrial relays are frequently used in safety circuits for:
- Safety relay output – to expand the current rating or contact life of a safety relay
- Master Control Relays (switching PLC power supplies)
- E-Stop Relays
- Directing course of action when a safety condition occurs
- Light curtain monitoring
- Press control

Additional Features and Options

- Switch up to 12 circuits with one relay
- Sealed contacts for dirty environments and low-energy switching
- Coil voltages from 12…600V AC and 6…600V DC
- Switch from 5…600V AC and DC
- Switch from 1 mA…35 A
- Pneumatic timers to maintain timing even if power is lost

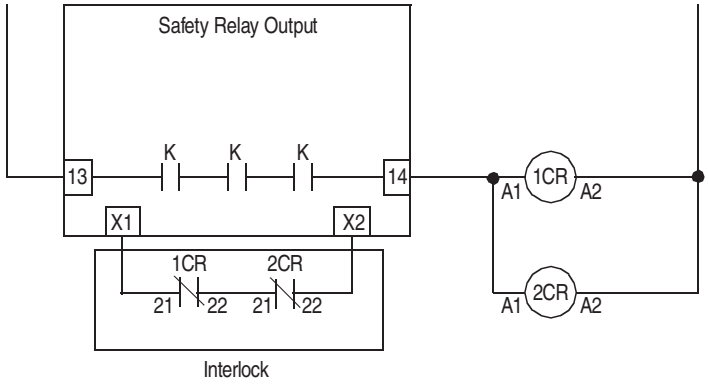
Relay Load Life Comparison—Pilot Duty Loads (solenoid valve, contactor coil, relay coil)

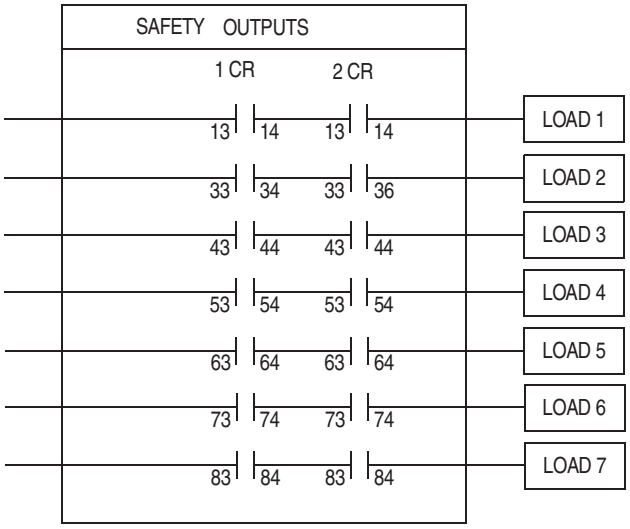


Does not change conditions of sales or warranty.

Safety Relay Output Block Diagram

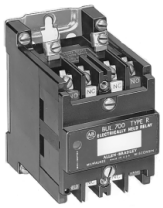
This diagram illustrates how 2 industrial relays can be used to expand safety relay outputs.





CR = Industrial Relay (700S-P, 700S-CF)

Note: 1 CR and 2 CR are Allen-Bradley industrial relays with mechanically linked contacts (Bulletins 700-P, 700-CF, and 700-M).

						
Bulletin No.	**700-M/MB**	**700-CF**	**700S-CF**	**700-P**	**700S-P**	**700-R**
Mechanically linked contacts ❶	Y ❷	Y	Y	Y ❸	Y ❸	N
Double-break contacts	Y	Y	Y	Y	Y	—
Switch millions of operations at >1 A	Y	Y	Y	Y	Y	Y
Low-energy switching	Y	Y	Y	Y	Y	Y
Marine certification—vibration applications	Y	Y	Y	Y	Y	Y
Relay Differences						
Number of circuits to switch (number of poles)	4…8	4…12	8…12	2…12	2…12	2…8
Current ratings at 120V AC	10 A	12 A	12 A	10…35 A	10 A	5 A
Pneumatic timer option	N	Y	N	Y	N	Y
Electronic timer option	Y	Y	N	Y	N	Y
Latch option	N	Y	N	Y	N	Y
Built-in surge suppression for 24V DC coil option	Y	Y	Y	N	N	Y ❹
Convertible and replaceable contacts	N	N	N	Y	N	Y
Switch 20…35 A on 6…12 poles	N	N	N	Y	N	N
DIN Rail Mounting	Y	Y	Y	N	N	N
Finger-Safe Terminals	Y	Y	Y	N	N	N
Poles permanently attached	N	N	Y	Y	Y	Y

❶ If a N.O. contact welds, the N.C. contacts will remain open and if a N.C. contact welds, the N.O. contacts will remain open.
❷ Yes for main poles, restrictions apply for auxiliary contacts.
❸ Bulletins 700-P and 700S-P meet the component requirements for relays of ANSI B11.19 section 5.5.1 (Control Reliability).
❹ Y for AC coil.

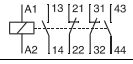
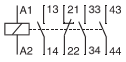
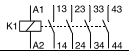
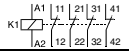
Bulletin 700-CF

- IEC Industrial Relays (Finger Safe Design
- Positively-Guided/Mechanically-Linked Contacts per IEC 947-5-1 Annex L on Main and Auxiliary Contacts
- Solid-State and Pneumatic Timing Modules
- 4…12 Poles
- 12…600V Coils

Table Of Contents

Product Selection 186
Accessories. 188
Specifications 193
Approximate Dimensions 196

~ 4-Pole AC Coil Voltage

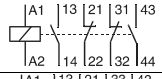
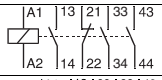
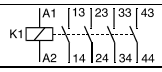
AC-12 I_{th} [A]		AC-15 I_{th} [A]							Connection Diagrams	Contacts		Standard Contacts Cat. No. ❶	Gold Bifurcated Contacts Cat. No. ❶
40°C	60°C	24/48V	120V	240V	400V	500V	600V	690V		N.O.	N.C.		
25	20	16	14	10	5	2.5	1.8	1		2	2	700-CF220⊗	700-CFB220⊗
										3	1	700-CF310⊗	700-CFB310⊗
										4	0	700-CF400⊗	700-CFB400⊗
										0	4	700-CF040⊗	700-CFB040⊗

⊗ Voltage Suffix Code

The Cat. No. as listed is incomplete. Select a Voltage Suffix Code from the table below to complete the Cat. No. Example: **Cat. No. 700-CF220**⊗ becomes **Cat. No. 700-CF220F**

Voltage	12	24	32	36	42	48	100	100-110	110	120	127	200	200-220	208	208-240	220-230	230	230-240	240	277	347	380	380-400	400	400-415	440	480	500	550	600
50 Hz	R	K	V	W	X	Y	KP	—	D	P	S	KG	—	—	—	F	—	VA	T	—	—	—	N	—	G	B	—	M	C	—
60 Hz	Q	J	—	V	—	X	—	KP	—	D	—	—	KG	H	L	—	—	—	A	T	I	E	—	—	—	N	B	—	—	C
50/60 Hz	—	KJ	—	—	—	KY	KP	—	KD	—	—	KG	—	—	—	—	KF	—	KA	—	—	—	—	KN	—	KB	—	—	—	—

4-Pole DC Coil Voltages

AC-12 I_{th} [A]		AC-15 I_{th} [A]							Connection Diagrams	Contacts		Standard Contacts Cat. No.❶	Gold Bifurcated Contacts Cat. No.❶
40°C	60°C	24/48V	120V	240V	400V	500V	600V	690V		N.O.	N.C.		
25	20	16	14	10	5	2.5	1.8	1		2	2	700-CF220⊗	700-CFB220⊗
										3	1	700-CF310⊗	700-CFB310⊗
										4	0	700-CF400⊗	700-CFB400⊗

⊗ Voltage Suffix Code ❷

The Cat. No. as listed is incomplete. Select a Voltage Suffix Code from the table below to complete the Cat. No. Example: **Cat. No. 700-CF220Z**⊗ becomes **Cat. No. 700-CF220ZJ for 24V DC**

Voltage	9	12	24	36	48	60	64	72	80	110	115	125	220	230	250
Standard	ZR	ZQ	ZJ	ZW	ZY	ZZ	ZB	ZG	ZE	ZD	ZP	ZS	ZA	ZF	ZT
With diode suppressor			DJ												

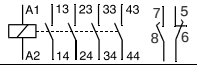
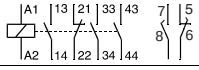
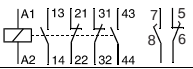
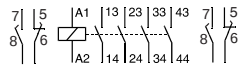
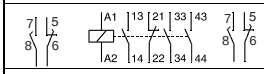
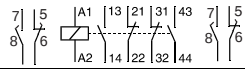
❶ All Cat. Nos. are factory-stocked.
❷ When ordering DJ coil with built-in surge suppression, the DJ is not polarity sensitive. Drop out time: 14…20 ms.

6- and 8-Pole Relays

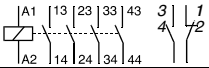
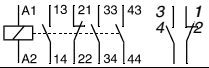
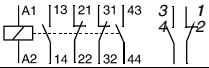
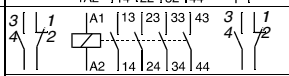
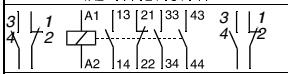
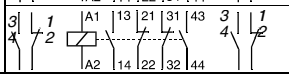
Cat. No. 700-CFZ 1420

Cat. No. 700-CFZ 0530

Control Relays with Overlapping Side-Mounted Contacts

AC-12 I_{th} [A]			AC-15 I_e [A]							Left Aux.	Relay Arrangement	Right Aux.	Contacts		Overlapping Side-Mounted Contacts		Cat. No. ❶
	40°C	60°C	24/48V	120V	240V	400V	500V	600V	690V				N.O.	N.C.	N.O.	N.C.	
Main Relay	25	20	16	14	10	5	2.5	1.8	1				4	0	1	1	700-CFZ1510⊗
													3	1	1	1	700-CFZ1420⊗
Side Contacts:	10	6	6	6	3	2	2	1.2	0.7				2	2	1	1	700-CFZ1330⊗
													4	0	2	2	700-CFZ2620⊗
													3	1	2	2	700-CFZ2530⊗
													2	2	2	2	700-CFZ2440⊗

Control Relays with Standard Side-Mounted Contacts

AC-12 I_{th} [A]			AC-15 I_e [A]							Left Aux.	Relay Arrangement	Right Aux.	Contacts		Standard Side-Mounted Contacts		Cat. No. ❶
40°C		60°C	24/48V	120V	240V	400V	500V	600V	690V				N.O.	N.C.	N.O.	N.C.	
Main Relay:	25	20	16	14	10	5	2.5	1.8	1				4	0	1	1	700-CFZ0510⊗
													3	1	1	1	700-CFZ0420⊗
													2	2	1	1	700-CFZ0330⊗
Side Contacts:	10	6	6	6	3	2	2	1.2	0.7				4	0	2	2	700-CFZ0620⊗
													3	1	2	2	700-CFZ0530⊗
													2	2	2	2	700-CFZ0440⊗

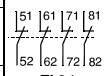
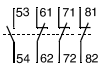
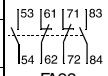
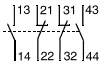
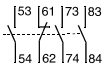
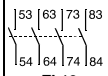
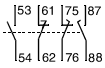
❶ All Cat. Nos. are factory stocked.

⊗ Voltage Suffix Code

The Cat. No. as listed is incomplete. Select a Voltage Suffix Code from the table below to complete the Cat. No. Example: **Cat. No. 700-CFZ0510**⊗ becomes **Cat. No. 700-CFZ0510F**.

Voltage	12	24	32	36	42	48	100	100-110	110	120	127	200	200-220	208	208-240	220-230	230	230-240	240	277	347	380	380-400	400	400-415	440	480	500	550	600
50 Hz	R	K	V	W	X	Y	KP	—	D	P	S	KG	—	—	—	F	—	VA	T	—	—	—	N	—	G	B	—	M	C	—
60 Hz	Q	J	—	V	—	X	—	KP	—	D	—	—	KG	H	L	—	—	—	A	T	I	E	—	—	—	N	B	—	—	C
50/60 Hz	—	KJ	—	—	—	KY	KP	—	KD	—	—	KG	—	—	—	—	KF	—	KA	—	—	—	—	KN	—	KB	—	—	—	—

Auxiliary Contacts

	Description	N.O.	N.C.	Connection Diagrams	For Use With	Cat. No. ❺
	Auxiliary Contact Blocks for Front Mounting ❶❸ • 2- and 4-pole • Quick and easy mounting without tools • Mutual positive guidance to the main contactor poles (except for L types) • Models with equal function with several terminal numbering choices L = Late break/Early make	0	2	-FA02	700-CF	100-FA02
				-FA11		
		1	1		700-CF	100-FA11
		2	0	-FA20	700-CF	100-FA20
				-FAL11		
		1L	1L		700-CF	100-FAL11
		0	4	 -FA04	700-CF	100-FA04
				 -FA13		
		1	3		700-CF	100-FA13
		2	2	 -FA22	700-CF	100-FA22
				 -FB22		
		3	1		700-CF	100-FA31
		4	0	 -FA31	700-CF	100-FA40
		1+1L	1+1L	 -FA40	700-CF	100-FAL22
				 -FAL22		

	Description	N.O.	N.C.	Connection Diagrams	For Use With	Cat. No. ❺
	Auxiliary Contact Blocks for Side Mounting without Sequence Terminal Designations ❷❸ • 1- and 2-pole • Two-way numbering for right or left mounting on the contactor • Quick and easy mounting without tools • Mutual positive guidance and to the main relay poles (except for L types) L = Late break/Early make	0	1	-SA01	700-CF	100-SA01
				-SA10		
		1	0		700-CF	100-SA10
		0	2	-SA02	700-CF	100-SA02
				-SA11		
		1	1		700-CF	100-SA11
		2	0	-SA20	700-CF	100-SA20
				-SAL11		
		L1	L1		700-CF	100-SAL11

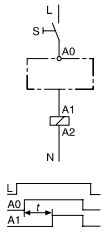
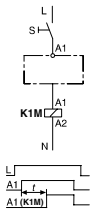
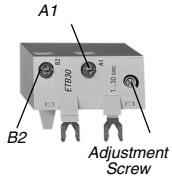
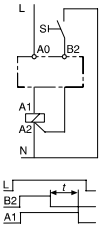
❶ Control Relay and Auxiliary Contact

700CF (AC and DC coils), vertical mounting, 60°C					
Cat. No. 700… ❺	Max. N.O. Side Aux.	Max. N.C. Side Aux.	Max. N.O. Front + Side Aux.	Max. N.C. Front + Side Aux.	Max. N.O. + N.C. Front + Side Aux.
CF400	2	4	6	6	6
CF310	2	4	6	6	6
CF220	2	4	6	6	6
CF040 ❹	2	2	4	4	4

700CF (AC and DC coils), vertical mounting, 40°C					
Cat. No. 700… ❺	Max. N.O. Side Aux.	Max. N.C. Side Aux.	Max. N.O. Front + Side Aux.	Max. N.C. Front + Side Aux.	Max. N.O. + N.C. Front + Side Aux.
CF400	2	4	6	7	7
CF310	2	4	6	7	7
CF220	2	4	6	7	7
CF040 ❹	2	3	4	5	5

❷ Up to 8 auxiliary contacts may be mounted (a maximum of 4 N.C. contacts on the front of the contactor and a maximum of 2 N.O. contacts on each side).
❸ Maximum No. of Contacts: Refer to the following tables
❹ AC coils only.
❺ All Cat. Nos. are factory stocked.

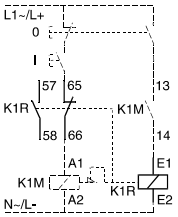
Control Modules

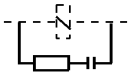
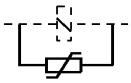
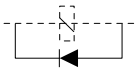
	Description		Connection Diagrams	Reset Time	Repeat Accuracy	For Use With	Cat. No. ❷
Cat. No. 100-FPTA30 *Mount on front of 700-CF Relay*	**Pneumatic Timing Module — ON Delay (1 N.O. + 1 N.C.)** Timed contact operates after the time delay. Relay contact operates instantaneously. • Continuous adjustment range	**ON-Delay** 0.3…30 s Range 1.8…180 s Range		25…90 ms for AC Coils 47…85 ms for DC coils	+/-10%	700-CF AC Coils DC Coils ❶	100-FPTA30 100-FPTA180
	Pneumatic Timing Module — OFF Delay (1 N.O + 1 N.C.) Timed contact will remain in operation until the end of the time delay. Relay contact operates instantaneously. • Continuous adjustment range	**OFF-Delay** 0.3…30 s Range 1.8…180 s Range				700-CF All	100-FPTB30 100-FPTB180
Cat. No. 100-ETA30	**Solid-state Timing Module** Changes all contacts on Bulletin 100-C contactors and Bulletin 700-CF control relays into timed contacts. **100-ETA** The contactor is switched on after the end of the delay time.	**ON-Delay** 0.1…3 s Range 1…30 s Range 10…180 s Range		100 ms min. 100 ms max.	+/-1%	700-CF 110…240V 50/60 Hz 110…250VDC	100-ETA3 100-ETA30 100-ETA180
		ON-Delay 0.1…3 s 1…30 s 10…180 s Range				700-CF with DC coils 24V DC and 48V DC	100-ETAZJ3 100-ETAZJ30 100-ETAZJ180
 *Cat. No. 100-ETB30*	**100-ETB** After interruption of the control signal, the contactor is switched off after the end of the set delay time. • Continuous adjustment range	**OFF-Delay** 0.3…3 s 1…30 s 10…180 s Range				700-CF 110…240V AC coils, 50/ 60 Hz	100-ETB3 100-ETB30 100-ETB180
						700-CF 24V AC coils	100-ETBKJ3 100-ETBKJ30 100-ETBKJ180

❶ Cannot be used with side-mounted auxiliary contacts.
❷ All Cat. Nos. are factory stocked.

Product Selection — Page 186
Specifications — Page 193
Approximate Dimensions — Page 196

Control Modules, Continued

	Description	Connection Diagrams	For Use With	Cat. No. ❷
Cat. No. 100-FL⊗	**Mechanical Latch—Mount on front of 700-CF Relay** In contactors and relays with latching, the coil is immediately switched off after closing by the contact on the latch (65 – 66). Consequently, no holding current flows. It can be used with all Bulletin 100-C contactor and Bulletin 700-CF relay models with AC operating mechanism (with AC coils). For 24…240V DC control voltage, use the AC coil with the same voltage rating. • Auxiliary Contacts 1 N.O. + 1 N.C.		700-CF	100-FL11⊗

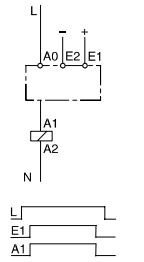
	Description			Connection Diagrams	For Use With	Cat. No. ❷
	Surge Suppressors Surge Suppressors reduce the high transient voltage generated when the coil circuit is opened. • Coil-mounted • Suitable for 100-C/700-CF	**RC Module** AC Operating Mechanism	24…48V 50/60 Hz		700-CF	100-FSC48
			110…280V 50/60 Hz			100-FSC280
			380…480V 50/60 Hz			100-FSC480
		Varistor Module AC/DC Operating Mechanism	12…55V AC/ 12…77V DC		700-CF	100-FSV55
			56…136V AC/ 78…180V DC			100-FSV136
			137…277V AC/ 181…350V DC			100-FSV277
			278…575V AC			100-FSV575
		Diode Module DC Operating Mechanism Dropout Time 70…95 ms	12…250V DC		700-CF with DC coils	100-FSD250

⊗ Voltage Suffix Code

The Cat. No. as listed is incomplete. Select a Voltage Suffix Code from the table below to complete the Cat. No. Example: **Cat. No. 100-FL11**⊗ becomes **Cat. No. 100-FL11J**. ❶

Voltage	24	48	100	110	120	230-240	240	277	380-400	400-415	440	480
50 Hz	K	Y	KP	D	—	VA	T	—	N	G	B	—
60 Hz	J	—	—	—	D	—	A	T	—	—	N	B

❶ For special voltages, consult your local Allen-Bradley Sales Office.
❷ All Cat. Nos. are factory stocked.

	Description		Connection Diagrams	For Use With	Cat. No. ❶
Cat. No. 100-JE	**Interface (Solid-state)—Mount on top of 700-CF Relay** Interface between the DC control signal (PLC) and the AC operating mechanism of the contactor or relay. • Interfaces a single DC control signal (12…48V DC) to a 100-C contactor or 700-CF relay. • Controls 110…240V AC coils on 100-C contactor and 700-CF relay. • Very low power requirements–allows use of high density, low current PLC outputs. • Mounts directly on 100-C contactor or 700-CF relay to save panel space. • Requires no additional surge suppression on contactor coil. • Pilot light indicates when contactor coil is energized.	Input: 18…30V DC Output: 110…240V AC	 *E1, E2 = DC Signal*	700-CF with AC coils	100-JE
		Input: 12V DC Output: 110…240V AC			100-JE12
		Input: 48V DC Output: 110…240V AC			100-JE48

	100-JE	100-JE12	100-JE48
Electrical			
Input Voltage	24V DC	12V DC	48V DC
Input Voltage Range	18…30V DC	6…12V DC	35…48V DC
Output Voltage	110…240V DC	110…240V DC	110…240V DC
Power Consumption	0.1…0.4 W	0.02…0.12 W	0.2…0.5 W
Minimum Actuation	5V DC, 2 mA DC	5V DC, 2 mA DC	5V DC, 2 mA DC
Mechanical			
Finger Protection	IP20	IP20	IP20
Pickup Time	0…10 ms + pickup time of the contactor	0…10 ms + pickup time of the contactor	0…10 ms + pickup time of the contactor
Dropout Time	0…10 ms + dropout time of the contactor	0…10 ms + dropout time of the contactor	0…10 ms + dropout time of the contactor
Max. Cycles Per Second	2 ❷	2 ❷	2 ❷
Isolation/Breakdown Voltage	In: 50V, Out: 250V	In: 50V, Out: 250V	In: 50V, Out: 250V
Rated Impulse Withstand Voltage	4 kV	4 kV	4 kV
Environmental			
Ambient Temperature Range	-25…60°C	-25…60°C	-25…60°C
Storage Temperature Range	-50…+80°C	-50…80°C	-50…80°C
Life	100+ million ops	100+ million ops	100+ million ops
Construction			
Wire Size Range 1 Wire 2 Wire 1 Wire 2 Wire Solid and Stranded	0.5…2.5 mm^2 (flexible wire) 0.75…2.5 mm^2 (flexible wire) 1.0…2.5 mm^2 (solid wire) 1.0…2.5 mm^2 (solid wire) 18…14 AWG	0.5…2.5 mm^2 (flexible wire) 0.75…2.5 mm^2 (flexible wire) 1.0…2.5 mm^2 (solid wire) 1.0…2.5 mm^2 (solid wire) 18…14 AWG	0.5…2.5 mm^2 (flexible wire) 0.75…2.5 mm^2 (flexible wire) 1.0…2.5 mm^2 (solid wire) 1.0…2.5 mm^2 (solid wire) 18…14 AWG
Tightening Torque	1…1.5 Nm/7…15 lb-in	1…1.5 Nm/7…15 lb-in	1…1.5 Nm/7…15 lb-in
Type of Light	LED	LED	LED

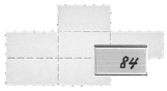
❶ All Cat. Nos. are factory stocked.
❷ To consider the maximum ops/hour of the contactors.

Assembly Components

	Description	For Use With	Pkg. Qty.	Cat. No. ❶
Cat. No. 100-SCCA	Protective Covers • Provides protection against unintended manual operation • For contactors and front mounted auxiliary contacts	700-CF, all	10	100-SCCA
Cat. No. 100-SCFA		100-FA, FB, FC, FP, FL	1	100-SCFA

Marking Systems

Uniform labelling materials for contactors, motor startup equipment, timing relays and circuit breakers.

	Description	Cat. No. ❶
	Label Sheet • 10 sheets with 105 self-adhesive paper labels each, 6 x 17 mm	100-FMS
	Marking Tag Sheet • 10 sheets with 160 perforated paper labels each, 6 x 17 mm • To be used with a transparent cover	100-FMP
	Transparent Cover • 100 each • To be used with marking tag sheets	100-FMC
	Marking Tag Carriers • 100 each • To be used with label frame: System V4/V5 System Bull. 1492W	100-FMA1 100-FMA2

Coils

	AC Coil Code	AC Voltages 50 Hz	AC Voltages 60 Hz	AC Voltages 50/60 Hz	Cat. No. ❶ 700-CF	DC Voltages	DC Coil Code	Cat. No. ❶700-CF
	Q	—	12V	—	TA006	9V	R	TA766
	R	12V	—	—	TA404	12V	Q	TA708
	J	—	24V	—	TA013	24V Diode	DJ	TA714M
	K	24V	—	—	TA407	24V	J	TA714
	KJ	—	—	24V	TA855	36V	W	TA719
	V	32V	36V	—	TA481	48V	Y	TA724
	W	36V	—	—	TA410	60V	Z	TA774
	X	42V	48V	—	TA482	64V	B	TA727
	Y	48V	—	—	TA414	72V	G	TA728
	KY	—	—	48V	TA860	80V	E	TA729
	KP	100V	100 – 110V	100V	TA861	110V	D	TA733
	D	110V	120V	—	TA473	115V	P	TA734
	KD	—	—	110V	TA856	125V	S	TA737
	P	120V	—	—	TA425	220V	A	TA747
	S	127V	—	—	TA428	230V	F	TA749
	KG	200V	200 – 220V	200V	TA862	250V	T	TA751
	H	—	208V	—	TA049	—	—	—
	L	200 – 220V	208 – 240V	—	TA296	—	—	—
	A	220V	240V	—	TA474	—	—	—
	F	220 – 230V	—	—	TA441	—	—	—
	KF	—	—	230V	TA851	—	—	—
	VA	230 – 240V	—	—	TA440	—	—	—
	T	240V	277V	—	TA480	—	—	—
	KA	—	—	240V	TA858	—	—	—
	I	—	347V	—	TA065	—	—	—
	E	—	380V	—	TA067	—	—	—
	N	380 – 400V	440V	—	TA071	—	—	—
	KN	—	—	400V	TA863	—	—	—
	G	400 – 415V	—	—	TA457	—	—	—
	B	440V	480V	—	TA475	—	—	—
	KB	—	—	440V	TA859	—	—	—
	M	500V	—	—	TA479	—	—	—
	C	550V	600V	—	TA476	—	—	—

❶ All Cat. Nos. are factory stocked.

General

			Main Relay Cat. No. 700-CF ❸	Front Adder Deck Contacts	Side-mounted Contacts
Contact Ratings — NEMA			A600, P600	A600, Q600	
Min. Contact Rating		Standard	20V, 10 mA		
		Gold	12V, 8 mA		
Contact Ratings — IEC AC-15 (solenoids, contactors) at rated voltage IEC 947, EN 60947		24V	16 A	6 A	6 A
		48V	16 A	6 A	6 A
		120V	14 A	6 A	6 A
		240V	10 A	5 A	3 A
		400V	5 A	3 A	2 A
		480V/500V	2.5 A	1.6 A	2 A
		600V	1.8 A	1.2 A	1.2 A
		690V	1 A	1.0 A	0.7 A
AC-12 (Control of resistive loads) IEC 60947	40°C	I_{th}	25 A	10 A	
		230V	10 kW		
		400V	17 kW		
		690V	30 kW		
	60°C	I_{th}	20 A	6 A	
		230V	8 kW		
		400V	14 kW		
		690V	24 kW		
DC-12 Switching DC Loads					
L/R < 1ms, Resistive Loads IEC 60947		24V	12 A	12 A	
		48V	9 A	9 A	
		110V	3.5 A	3.5 A	
		220V	0.55 A	0.55 A	
		440V	0.2 A	0.2 A	
DC-13 IEC 60947, Solenoids and contactors		24V	5 A	5 A	3 A
		48V	2 A	2 A	1.5 A
		125V	0.7 A	0.7 A	0.6 A
		220V	0.25 A	0.25 A	0.3 A
		440V	0.12 A	0.12 A	0.2 A
		660V	0.14 A	0.1 A	0.1 A
			Yes	Yes ❶	

Positively Guided Contacts ❷

Location of welded N.O. contacts	State of N.C. Contacts if N.O. contact welds				
	Main	Front aux.	Left side aux.	Right side aux.	
Main	Open	Open ❶	Open	Open	
Front aux.	Open	Open ❶	Open	Open	
Left side aux.	Open	Open ❶	Open	Open	
Right side aux.	Open	Open ❶	Open	Open	

❶ If the accessory is a pneumatic timer or latch, there is no positive guidance; the accessory contacts are independent.

❷ Defined in IEC 947-5-1 annex L. Positive guidance is a relationship between contacts of opposite types (i.e., N.O. and N.C.).

			Cat. No. 700-CF	Aux./Pneumatic Timer Contact (Front-mounted)
Mechanical Life		[Mil]	15	15
Electrical Life	AC-15 (240V, 3 A)	[Mil]	1.5	1.5
Weight	AC Op. Mechanism	[g]	390	—
Terminal Cross-Sections				
Terminal Type				
Terminal Size per IEC 947-1			2 x A4	2 x A4
Solid/Stranded ❸	1 Conductor	[mm²]	1.5…6	0.5…2.5
	2 Conductor	[mm²]	1.5…6	0.75…2.5
Max. Wire Size per UL/CSA		[AWG]	16…10	18…14
Tightening Torque		[lb.-in.]	8.9…22	8.9…13.3
Tightening Torque		[N•m]	1…2.5	1…1.5

❸ For 16 or more strands, end ferrule is required

DC Switching Ratings for 700-CF Main Poles in Series (Resistive Load at 60° C)

	1 pole	2 poles	3 poles
24/48 V	25/20 A	25 A	25 A
125 V	6 A	25 A	25 A
220 V	1.5 A	8 A	25 A
440 V	0.4 A	1 A	3 A

Control Circuit

			Cat. No. 700-CF
Operating Voltage			
AC 50/60 Hz	Pickup	[x U_s]	0.85…1.1
	Dropout	[x U_s]	0.3…0.6
DC ❶	Pickup	[x U_s]	0.8…1.1
	Dropout	[x U_s]	0.1…0.6
Coil Consumption			
AC 50/60 Hz	Inrush	[VA/W]	70/50
	Seal	[VA/W]	8/2.6
DC	Inrush/Seal	[W]	6.00
Operating Times			
AC 50/60 Hz	Pickup Time	[ms]	15…30
	Dropout Time	[ms]	10…60
DC	Pickup Time	[ms]	40…70
	Dropout Time	[ms]	7…15
Latch Attachment Release, 100-FL			
Coil Consumption		[VA/W] [W]	AC 45 VA/40W DC 25 W
Contact Signal Duration		[min./max]	0.03…15 s
Timing Attachment			
Reset Time, 100ETA, 100-ETB		[ms]	
at min. time setting			10
at max. time setting			70
	Repeat Accuracy		± 10%

❶ For 9V DC, code ZR, use operating voltage 0.65… 1.3 x U_s.
For 24V DC, code ZJ or DJ, use operating voltage 0.7… 1.25 x U_s.

General

	Cat. No. 700-CF
Rated Insulation Voltage U_i	
IEC	690V
UL; CSA	600V
Rated Impulse Strength U_{imp}	8 kV
High Test Voltage	
1 minute (per IEC 947-4)	2500V
Rated Voltage U_e	
AC	115, 230, 400, 500, 690V
DC	24, 48, 110, 220, 440V
Short-Circuit Protection IEC 158-1 Fuse	
Rated Frequency	50/60 Hz, DC
Ambient Temperature	
Storage	–55…+80°C (–67…176°F)
Operation at nominal current	–25…+60°C (–13…140°F)
Conditioned 15% current reduction after AC-1 at > 60°C	–25…+70°C (–13…158°F)
Corrosion Resistance	humid-alternating climate, cyclic, per IEC 68-2-30 and DIN 50 016, 56 cycles
Altitude	2000 m above mean sea level, per IEC 947-4
Type of Protection	
IP20 (IEC 529 and DIN 40050)	in connected state
Finger Protection	safe from touch by fingers and back of hand per VDE 0106, Part 100
Shock Resistance	IEC 68-2: Half sinusoidal shock 11 ms, 30 G (in 3 directions)
Vibration Resistance	IEC 68-2: Static >2 G, in normal position no malfunction <5 G

Utilization Category Table from EN 947-5-1

Verification of Making and Breaking Capacities of Switching Elements Under Normal Conditions Corresponding to the Utilization Categories ❷

Utilization Category	Normal Condition of Use								
	Make ❸			Break ❸			Number and Rate of Making and Breaking operations		
	I/I_e	U/U_e	cos ψ	I/I_e	U/U_e	cos ψ	No. operating cycles ❹	Operating cycles per minute	ON time (s) ❻
AC-12 ❼	1	1	0.9	1	1	0.9	6050	6	0.05
AC-13 ❼	2	1	0.65	1	1	0.65	6050	6	0.05
AC-14 ❼	6	1	0.3	1	1	0.3	6050	6	0.05
AC-15 ❼	10	1	0.3	1	1	0.3	6050	6	0.05
DC			$T_{0.95}$			$T_{0.95}$			
DC-12	1	1	1 ms	1	1	1	6050	6	0.05 ❻
DC-13	1	1	6 x P ❺	1	1	6 x P ❺	6050	6	0.05 ❻
DC-14 ❼	10	1	15 ms	1	1	15	6050	6	0.05 ❼

I_e Rated operational current
U_eRated operational voltage I Current to be made or broken
PU_eI_e Steady-state power consumption (W)
$T_{0.95}$Time to reach 95% of the steady-state current (ms) U Voltage before make

❷ See sub-clause 8.3.3.5.2.
❸ For tolerances on test quantities, see sub-clause 8.3.2.2.
❹ The first 50 operating cycles shall be run at U/U_e=1.1 with the loads set at U_e.
❺ The value "6 x P" results from an empirical relationship which is found to represent most DC magnetic loads to an upper limit of P = 50 W, e.g., 6 x P = 300 W.
❻ The ON time shall be at least equal to $T_{0.95}$.
❼ Where the break current differs from the make current value, the ON time refers to the make current value after which the current is reduced to the break current value for a suitable period e.g., 0.05 s.

Contact Rating Table from EN 947-5-1

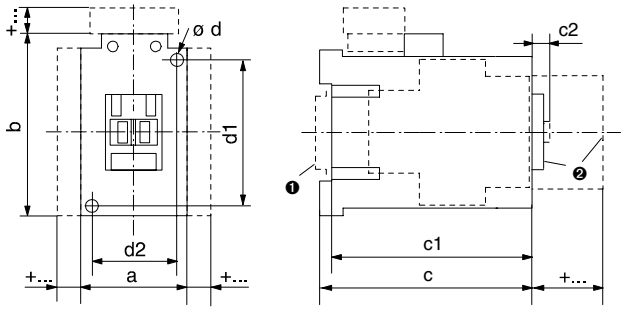
Examples of Contact Rating Designation Based on Utilization Categories

NEMA Designation ❶	IEC Utilization Category	Conventional Thermal Current I_{the} (A)	Rated Operational Current I_e (A) at Rated Operational Voltage U_e						VA Rating	
	AC		120V	240V	380V	480V	500V	600V	Make	Break
A150	AC-15	10	6	—	—	—	—	—	7200	720
A300	AC-15	10	6	3	—	—	—	—	7200	720
A600	AC-15	10	6	3	1.9	1.5	1.4	1.2	7200	720
B150	AC-15	5	3	—	—	—	—	—	3600	360
B300	AC-15	5	3	1.5	—	—	—	—	3600	360
B600	AC-15	5	3	1.5	0.95	0.75	0.72	0.6	3600	360
C150	AC-15	2.5	1.5	—	—	—	—	—	1800	180
C300	AC-15	2.5	1.5	0.75	—	—	—	—	1800	180
C600	AC-15	2.5	1.5	0.75	0.47	0.375	0.35	0.3	1800	180
D150	AC-14	1.0	0.6	—	—	—	—	—	432	72
D300	AC-14	1.0	0.6	0.3	—	—	—	—	432	72
E150	AC-14	0.5	0.3	—	—	—	—	—	216	36
	DC		125V	250V	440V	500V	600V			
N150	DC-13	10	2.2	—	—	—	—		275	275
N300	DC-13	10	2.2	1.1	—	—	—		275	275
N600	DC-13	10	2.2	1.1	0.63	0.55	0.4		275	275
P150	DC-13	5	1.1	—	—	—	—		138	138
P300	DC-13	5	1.1	0.55	—	—	—		138	138
P600	DC-13	5	1.1	0.55	0.31	0.27	0.2		138	138
Q150	DC-13	2.5	0.55	—	—	—	—		69	69
Q300	DC-13	2.5	0.55	0.27	—	—	—		69	69
Q600	DC-13	2.5	0.55	0.27	0.15	0.13	0.1		69	69
R150	DC-13	1.0	0.22	—	—	—	—		28	28
R300	DC-13	1.0	0.22	0.1	—	—	—		28	28

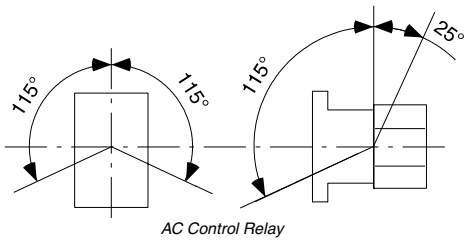
❶ This letter stands for the conventional thermal current and identifies AC or DC: e.g., B = 5 A AC. The number that follows is the rated insulation voltage

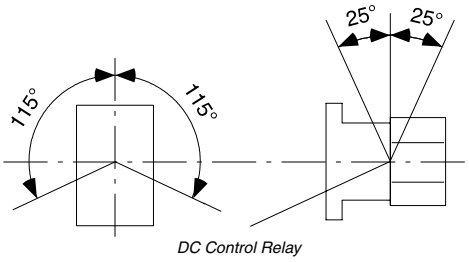
Approximate Dimensions

Approximate Dimensions are shown in millimeters (inches). Approximate Dimensions are not intended for manufacturing purposes.



Mounting Position





Relay

Type	a	b	c	c1	c2	∅d	d1	d2
700-CF	45 (1-25/32)	81 (3-3/16)	80.5 (3-11/64)	75.5 (3-3/32)	6 (1/4)	2 screws 4.5 (3/16)	60 (2-23/64)	35 (1-25/64)
700-CF___Z	45 (1-25/32)	81 (3-3/16)	106.5 (4-3/16)	101.5 (4)	6 (1/4)	2 screws 4.5 (3/16)	60 (2-23/64)	35 (1-25/64)

❶ May be mounted to 35 mm EN 50 022 DIN Rail.

Accessories

Relay with		AC Control Relay		DC Control Relay	
		mm	(inches)	mm	(inches)
Auxiliary Contact for Front Mounting	2- or 4-pole	c/c1 + 39	(c/c1 + 1 – 37/64)	c/c1 + 39	(c/c1 + 1 – 37/64)
Auxiliary Contact for Side Mounting	1- or 2-pole	a + 9	(a + 23/64)	a + 9	(a + 23/64)
Pneumatic Timing Module	—	c/c1 + 58	(c/c1 + 2 – 23/64)	—	—
Solid-state Timing Module	on coil terminal side	b + 24	(b + 15/16)	b + 24	(b + 15/16)
Mechanical Interlock	on side of contactor	a + 9	(a + 23/64)	a + 9	(a + 23/64)
Mechanical Latching	—	c/c1 + 61	(c/c1 + 2 – 31/64)	—	—
Interface	on coil terminal side	b + 9	(b + 23/64)	—	—
Protective Element	on coil terminal side	b + 3	(b + 1/8)	b + 3	(b + 1/8)
Labelling with:	label sheet	+0	(+0)	+0	(+0)
	marking tag with cover	+0	(+0)	+0	(+0)
	marking tag carrier for System V4/V5	+5.5	(+7/32)	+5.5	(+7/32)
	marking tag carrier for System Bull. 1492W	+5.5	(+7/32)	+5.5	(+7/32)

Product Selection — Page 186
Accessories — Page 188
Specifications — Page 193

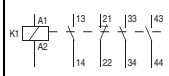
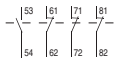
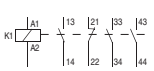
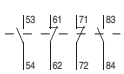
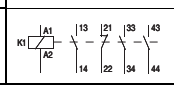
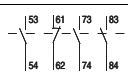
Bulletin 700S-CF

- IEC Industrial Safety Relay
- Positively Guided/Mechanically Linked Contacts as Per IEC 947-5-1 Annex L
- Third Party Certification By SUVA
- Red Cover and Mechanically Linked Contact Symbol on Front Face

Table Of Contents

Product Selection 197
Specifications 199
Approximate Dimensions 200

Type CF Safety Control Relays — 8-Pole AC Voltage

AC-1			AC-11 and AC-15							Connection Diagrams		Contacts		Catalog Number ❶
I_e [A]			I_e [A]							Main Contacts	Auxiliary Contacts			
	40°C	60°C	24/48V	120V	240V	400V	500V	600V	690V			N.O.	N.C.	
Main Contacts	25	20	16	14	10	5	2.5	1.8	1			4	4	700S-CF440⊗C
												5	3	700S-CF530⊗C
Adder Deck Contacts	10	6	6	6	3	2	2	1.2	0.7			6	2	700S-CF620⊗C

❶ All Cat. Nos. are factory-stocked.

⊗ AC Voltage Suffix Code

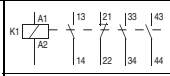
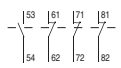
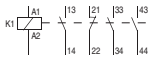
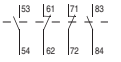
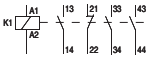
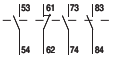
Voltage	12	24	32	36	42	48	100	100-110	110	120	127	200	200-220	208	208-240	220-230
50 Hz	R	K	V	W	X	Y	KP	–	D	P	S	KG	–	–	–	F
60 Hz	Q	J	–	V	–	X	–	KP	–	D	–	–	KG	H	L	–
50/60 Hz	–	KJ	–	–	–	KY	KP	–	KD	–	–	KG	–	–	–	–

Voltage	230	230-240	240	277	347	380	380-400	400	400-415	440	480	500	550	600
50 Hz	–	VA	T	–	–	–	N	–	G	B	–	M	C	–
60 Hz	–	–	A	T	I	E	–	–	–	N	B	–	–	C
50/60 Hz	KF	–	KA	–	–	–	–	KN	–	KB	–	–	–	–

❶ All Cat. Nos. are factory-stocked.
❷ See page 198 for coil voltage selection information.

Ordering Details

Type CF Control Relays — 8-Pole DC Voltage

DC-1		DC-11 and DC-15							Connection Diagrams		Contacts		Catalog Number ❶ ❷
I_e [A]		I_e [A]							Main Contacts	Auxiliary Contacts			
40°C	60°C	24/48V	120V	240V	400V	500V	600V	690V			N.O.	N.C.	
25	20	16	14	10	5	2.5	1.8	1			4	4	700S-CF440Z⊗C
											5	3	700S-CF530Z⊗C
											6	2	700S-CF620Z⊗C

❶ All Cat. Nos. are factory-stocked.
❷ See page 198 for coil voltage selection information.

⊗ DC Voltage Suffix Code ❸

Voltage	9	12	24	36	48	60	64	72	80	110	115	125	220	230	250
Standard	R	Q	J	W	Y	Z	B	G	E	D	P	S	A	F	T
With diode suppressor å	—	—	DJ	—	—	—	—	—	—	—	—	—	—	—	—

❸ When ordering **DJ** coil with built-in surge suppression, remove **Z** from the Cat. No. Example: Cat. No. 700S-CF440Z⊗C becomes Catalog Number 700S-CF440DJC

Accessories

Safety Control Relays with	mm.	(inches)
Auxiliary contact block for side mounting 1- or 2-pole	a + 9	(a + 23/64)
Electronic Timing Module on coil terminal side	b + 24	(b + 15/16)
Mechanical Interlock on side of contactor	a + 9	(a + 23/64)
Interface Module on coil terminal side	b + 9	(b + 23/64)
Surge Suppressor on coil terminal side	b + 3	(b + 1/8)
Labeling with label sheet marking tag sheet with clear cover marking tag adapter for System Bul. 1492W	+ 0 + 0 + 5.5	(+ 0) (+ 0) (+ 7/32)

General

			Main Relay Cat. No. 700S-CF ❸	Front Adder Deck Contacts	Side-mounted Contacts
Contact Ratings — NEMA			A600, P600	A600, Q600	
Min. Contact Rating		Standard	20V, 10 mA		
		Gold	12V, 8 mA		
Contact Ratings — IEC AC-15 (solenoids, contactors) at rated voltage IEC 947, EN 60947		24V	16 A	6 A	6 A
		48V	16 A	6 A	6 A
		120V	14 A	6 A	6 A
		240V	10 A	5 A	3 A
		400V	5 A	3 A	2 A
		480V/500V	2.5 A	1.6 A	2 A
		600V	1.8 A	1.2 A	1.2 A
		690V	1 A	1.0 A	0.7 A
AC-12 (Control of resistive loads) IEC 60947	40°C	I_{th}	25 A	10 A	
		230 V	10 kW		
		400 V	17 kW		
		690 V	30 kW		
	60°C	I_{th}	20 A	6 A	
		230V	8 kW		
		400V	14 kW		
		690V	24 kW		
DC-12 Switching DC Loads					
L/R < 1ms, Resistive Loads IEC 60947		24V	12 A	12 A	
		48V	9 A	9 A	
		110V	3.5 A	3.5 A	
		220V	0.55 A	0.55 A	
		440V	0.2 A	0.2 A	
DC-13 IEC 60947, Solenoids and contactors		24V	5 A	5 A	3 A
		48V	2 A	2 A	1.5 A
		125V	0.7 A	0.7 A	0.6 A
		220V	0.25 A	0.25 A	0.3 A
		440V	0.12 A	0.12 A	0.2 A
		660V	0.14 A	0.1 A	0.1 A
			Yes	Yes ❶	

Positively Guided Contacts ❷

Location of welded N.O. contacts	State of N.C. Contacts if N.O. contact welds				
	Main	Front aux.	Left side aux.	Right side aux.	
Main	Open	Open ❶	Open	Open	
Front aux.	Open	Open ❶	Open	Open	
Left side aux.	Open	Open ❶	Open	Open	
Right side aux.	Open	Open ❶	Open	Open	

❶ If the accessory is a pneumatic timer or latch, there is no positive guidance; the accessory contacts are independent.
❷ Defined in IEC 947-5-1 annex L. Positive guidance is a relationship between contacts of opposite types (i.e., N.O. and N.C.).

			Cat. No. 700S-CF	Aux./Pneumatic Timer Contact (Front-mounted)
Mechanical Life		[Mil]	15	15
Electrical Life	AC-15 (240V, 3 A)	[Mil]	1.5	1.5
Weight	AC Op. Mechanism	[g]	390	—
Terminal Cross-Sections				
Terminal Type				
Terminal Size per IEC 947-1			2 x A4	2 x A4
Solid/Stranded ❸	1 Conductor	[mm²]	1.5…6	0.5…2.5
	2 Conductor	[mm²]	1.5…6	0.75…2.5
Max. Wire Size per UL/CSA		[AWG]	16…10	18…14
Tightening Torque		[lb.-in.]	8.9…22	8.9…13.3
Tightening Torque		[N•m]	1…2.5	1…1.5

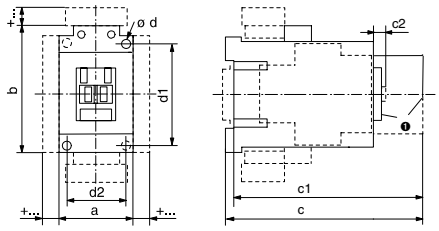
❸ For 16 or more strands, end ferrule is required

DC Switching Ratings for 700S-CF Main Poles in Series (Resistive Load at 60° C)

	1 pole	2 poles	3 poles
24/48 V	25/20 A	25 A	25 A
125 V	6 A	25 A	25 A
220 V	1.5 A	8 A	25 A
440 V	0.4 A	1 A	3 A

Approximate Dimensions

Approximate Dimensions are shown in millimeters (inches). Approximate Dimensions are not intended for manufacturing purposes.



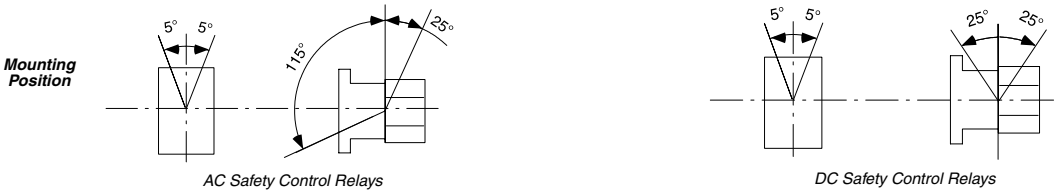
AC Safety Control Relays

a	b	c	c1	c2	Ød	d1	d2	Cat. No.
45 (1-25/32)	81 (3-3/16)	119.5 (4-3/4)	114.5 (4-43/64)	6 (1/4)	2 - 4.5 (2 - 3/16)	60 (2-23/64)	35 (1-25/64)	700S-CF

DC Safety Control Relays

a	b	c	c1	c2	Ød	d1	d2	Cat. No.
45 (1-25/32)	81 (3-3/16)	145.5 (5-49/64)	140.5 (5-37/64)	6 (1/4)	2 - 4.5 (2 -3/16)	60 (2-23/64)	35 (1-25/64)	700S-CF

Mounting Positions



AC Safety Control Relays

DC Safety Control Relays

Safety Relay Circuit With 5 Safety Outputs

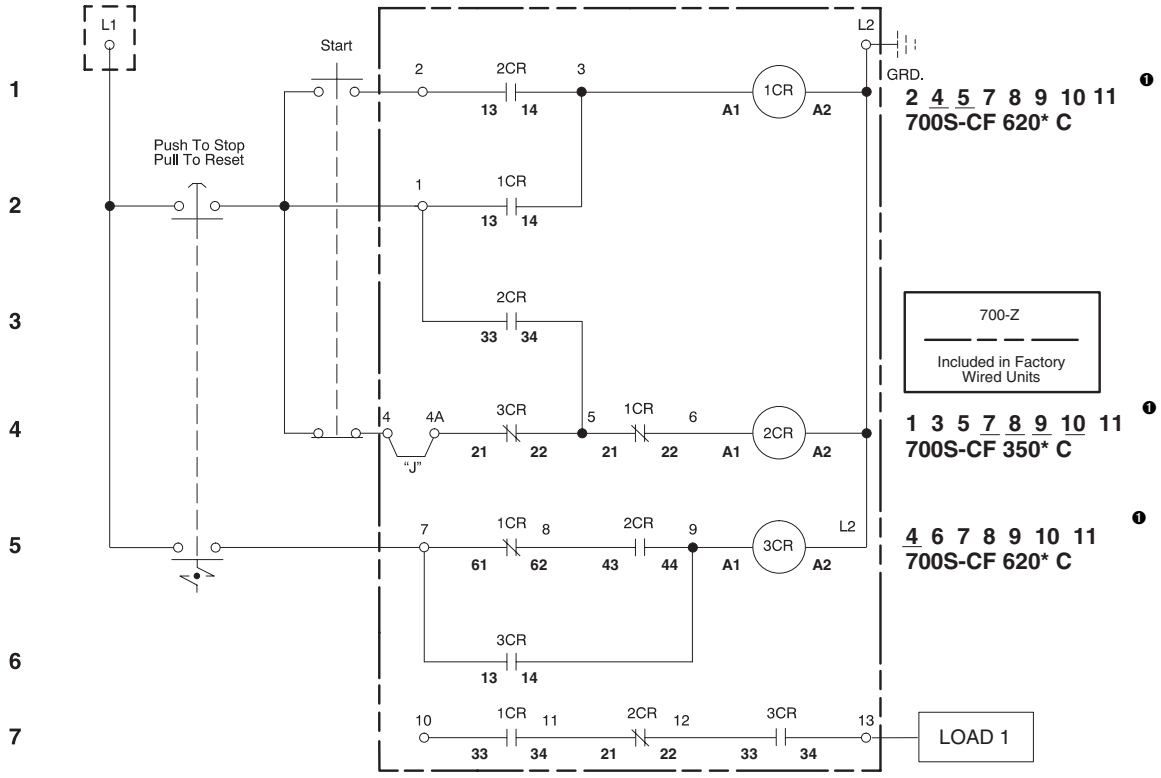
- Use for E-stop control. E-stop will work properly if any one fault occurs (a fault could be one welded contact or one undesired open connection such as a loose wire).
- High output switching capability and long contact life.
- Circuit complies with EN 954 categories 1, 2, 3, 4
- Prevents restart of the 5 safety outputs if there is a single fault anywhere in the system.

Use (3) 700S-CF relays and this diagram to construct the circuit, or contact your local Allen Bradley sales office for pre-assembled module

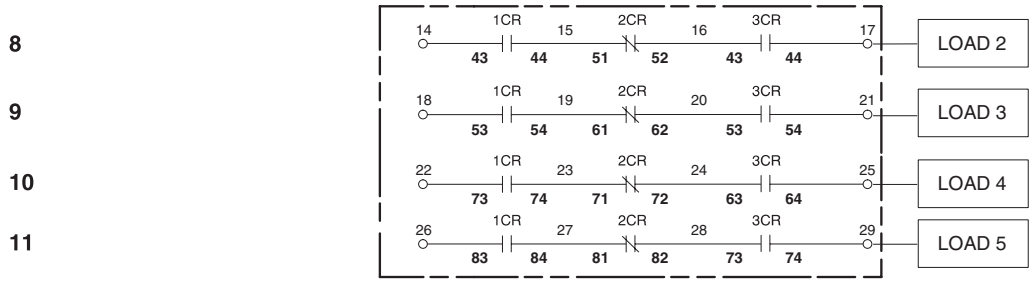
.

Basic Circuit

(1) Output Circuit (3 Relays, 9 Terminal Blocks)



(5) Output Circuit (3 Relays, 17 Terminal Blocks)



❶ Numbers shown are the line numbers where the contacts for this relay appear.

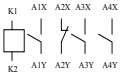
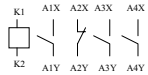
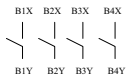
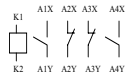
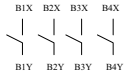
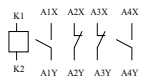
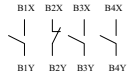
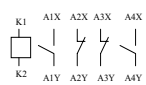
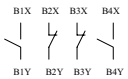
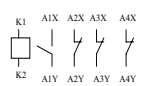
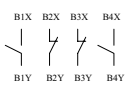
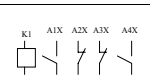
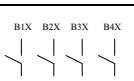
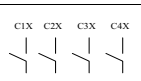
Bulletin 700S-P

- Mechanically Linked Contacts Meeting IEC 947-5-1-L
- 2…12 poles – all Mechanically Linked
- Red Faceplate for Easy Identification of Safety Circuits
- IEC Mechanically linked Contacts Symbol Displayed on Front
- Double-break Contacts to Reduce Probability of Welded Contacts
- Visual Indication of Contact State
- Tamper Resistant Cover Helps Prevent Changes Which Could Jeopardize Safety
- Complete Catalog Number Displayed on Front
- Ideal for use in Safety Circuits

Table Of Contents

Product Selection 202
Specifications 203
Approximate Dimensions 204

Type S-P Safety Control Relays — AC and DC Coil Voltages

Connection Diagrams and terminal markings			Contacts		AC Coils	24V DC Coils
Coil and Main Contacts	Additional Contacts	Additional Contacts	N.O.	N.C.	Cat. No. ❶	Cat. No. ❶
	—	—	3	1	700S-P310⊗	700S-DCP310Z24
	—	—	2	2	700S-P220⊗	700S-DCP220Z24
		—	7	1	700S-P710⊗	700S-DCP710Z24
		—	6	2	700S-P620⊗	700S-DCP620Z24
		—	5	3	700S-P530⊗	700S-DCP530Z24
		—	4	4	700S-P440⊗	700S-DCP440Z24
		—	3	5	700S-P350⊗	700S-DCP350Z24
			10	2	700S-P1020⊗	700S-DCP1020Z24

❶ For other coil voltages, consult your local Allen-Bradley Sales Office. All Cat. Nos. are factory-stocked.

⊗ AC Voltage Suffix Code

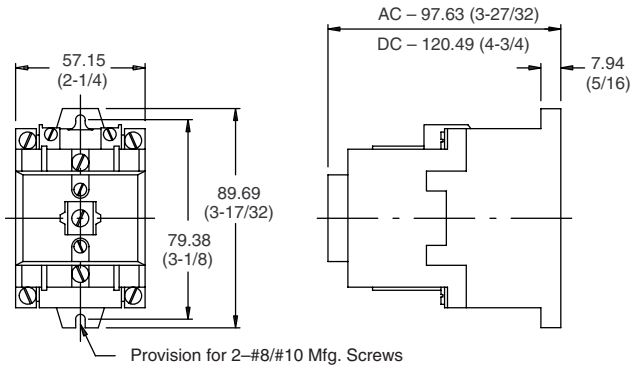
The Cat. No. as listed is incomplete. Select a voltage suffix code from the table below to complete the Cat. No.
Example: Cat. No. 700S-P310 becomes Cat. No. 700S-P310A1 for a 120V AC coil.

Hz	24	115-120	230-240	277	460-480
60	A24	A1	A2	A27	A4

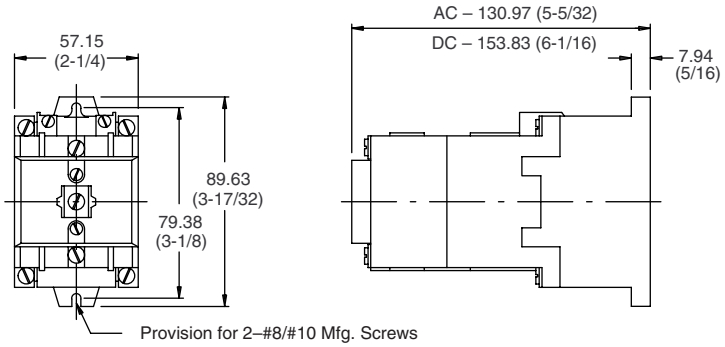
Type			700S-P					
Electrical								
Contact Rating Continuous			10 A @ 600V AC 5 A @ 600V DC					
Ratings Make/Break	AC		NEMA A600					
	DC		NEMA P600					
Minimum Contact Switching Ratings			10V, 50 mA					
DC Switching	Contacts in Series		Volts DC					
			24	**64**	**125**	**250**	**500**	**600**
		1	5 A	2.2 A	1.1 A	0.55 A	0.24 A	0.2 A
		2	10 A	10 A	5 A	2 A	0.7 A	0.5 A
		3	—	—	7 A	3 A	1.5 A	1.0 A
		4	—	—	10 A	5 A	2.5 A	1.5 A
Contact Electrical Life—Resistive Loads			1.5 million operations at 10A break at 120V AC 14 million operations at 1A break at 120V AC 6 million operations at 1A break at 24V DC					
Coil Voltage Range ❶	AC		85…110%					
	DC		80…110%					
	Battery Charging		85…115%					
Coil Consumption			**50 Hz**				**60 Hz**	
	AC	Inrush	132 VA				138 VA	
		Sealed	19.3 VA				19 VA	
	DC	Inrush	12.7 W					
		Sealed	12.7 W					
Mechanical								
Mechanically Linked Contacts			All contacts are mechanically linked per IEC 947-5-1 annex L for 2 to 12 poles					
Operating Time	Pickup		AC – 10…20 ms DC – 30…50 ms					
	Dropout		AC – 10…20 ms DC – 20…33 ms					
Mechanical Life			12.5 million operations ❷					
Construction								
Contact Arrangement			2 to 12 Poles, Double Break Contacts N.O. or N.C. (8 N.C. Maximum)					
Contact Material/Design			Silver Nickel/Bifurcated					
Mounting			Panel mount or mount on 700-MP Rail Horizontal Mounting Recommended					
Environmental								
Temperature	Operating ❸		–20…+65°C (–4…149°F)					
	Storage		–40…+65°C (–40…149°F)					
Wire Terminations								
Wire size per UL/CSA			1X #18 AWG…2X #12 AWG					
Tightening Torque			8…12 lb-in. (0.9…1.4 N•m)					

❶ Coil voltage required for proper operation (percent of rated coil voltage).
❷ 90% of devices are expected to meet or exceed 12.5 million operations, and 50% of devices are are expected to meet 20 million operations.
❸ Temperature inside the panel.

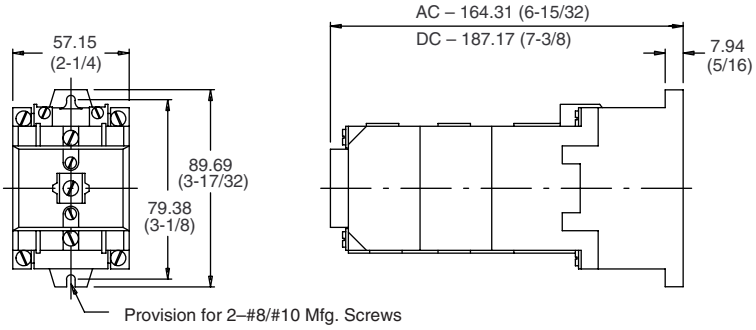
Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.



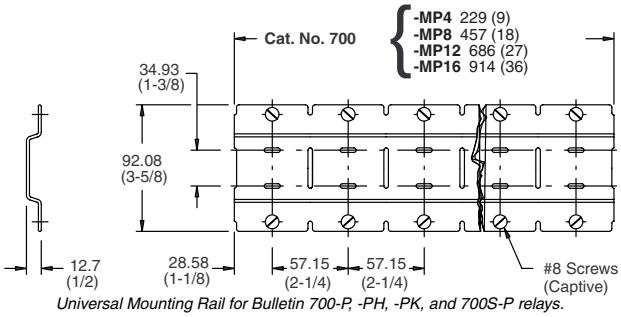
2-pole and 4-pole Bulletin 700S-P Relay
Approximate Shipping Weight AC – 0.68 kg (1.5 lbs.),
DC – 1.34 kg (2.95 lbs.)



6- and 8-pole Bulletin 700S-P Relay
Approximate Shipping Weight AC – 0.79 kg (1.75 lbs.),
DC – 1.45 kg (3.20 lbs.)



10- and 12-pole Bulletin 700S-P Relay
Approximate Shipping Weight AC – 1.02 kg (2.25 lbs.),
DC – 1.68 kg (3.7 lbs.)



Universal Mounting Rail for Bulletin 700-P, -PH, -PK, and 700S-P relays.

Secure the mounting strip with 2 screws at each end relay position.
Use a minimum of one screw at the 3rd, 5th, 7th, etc., relay positions.
Alternate between upper and lower horizontal slots.

Bulletin 700-M

- IEC Compact Industrial Relay
- 700-M Standard Contacts (10 A)
- 700-MB Bifurcated Contacts For Low Energy Loads
- Positively Guided/Mechanically Linked Contacts Per IEC 947-5-1 on All 700-M Relays

Table Of Contents

Product Selection **205**
Accessories **206**
Specifications **207**
Approximate Dimensions **210**

AC Control Relays (700-M) and Control Relays with Bifurcated Contacts (700-MB)❶

Contact Configuration		Pkg. Qty. ❷	Cat. No. ❷ ❸
N.O.	N.C.		
2	2	1	700-M220⊗S
3	1	1	700-M310⊗S
4	—	1	700-M400⊗S
2	2	1	700-MB220⊗S
3	1	1	700-MB310⊗S
4	—	1	700-MB400⊗S

⊗ AC Voltage Suffix Code

The Cat. No. as listed is incomplete. Select a voltage suffix code from the table below to complete the Cat. No. Example: **Cat. No. 700-MB400⊗S** becomes **Cat. No. 700-MB400A24S**. For other voltages, consult your local Allen-Bradley Sales Office.

Voltage	24	48	100	110…120	220…230	230…240	380	440	440…480
50 Hz	A24	A48	A1	—	A2	—	A3	A4	—
60 Hz	A24	A48	—	A1	—	A2	A3	—	A4

DC Control Relays (700DC-M) and Control Relays with Bifurcated Contacts (700DC-MB) ❹ ❶

Contact Configuration		Pkg. Qty. ❷	Cat. No. ❸
N.O.	N.C.		
2	2	1	700DC-M220⊗S
3	1	1	700DC-M310⊗S
4	—	1	700DC-M400⊗S
2	2	1	700DC-MB220⊗S
3	1	1	700DC-MB310⊗S
4	—	1	700DC-MB400⊗S

❶ Positively Guided Contacts — Summary:
700-M, 700-MB, 700DC-M, and 700DC-MB relays are positively guided for 4 main poles. Restrictions apply when using auxiliary contacts.
❷ 10-packs can be ordered for the following voltage codes: A1, A2, A24, Z24, D24. To order a 10-pack, specify quantity in multiples of 10 and drop the final "S" from the catalog number.
❸ All Cat. Nos. are factory stocked.
❹ To determine whether a 700DC-M relay has a diode, check the voltage label above the A1 terminal. A green background indicated that the relay has a built-in diode; a white background indicates that there is no diode.

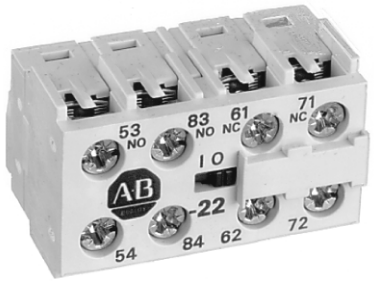
⊗ DC Voltage Suffix Code

The Cat. No. as listed is incomplete. Select a voltage suffix code from the table below to complete the Cat. No. Example: **Cat. No. 700DC-MB400⊗S** becomes **Cat. No. 700DC-MB400Z24S**. To order a relay with a diode surge suppressor, in a 24V DC coil, change the letter "**Z**" to "**D**". Example: **Cat. No. 700DC-MB220Z24** becomes **Cat. No. 700DC-MB220D24** (coil tab is green for diode.)

Voltage	12	24	24 with Diode	48	80	110	125	220
DC	Z12	Z24	D24❷	Z48	Z80	Z11	Z3	Z2

Accessories

Auxiliary Contact Adder Decks

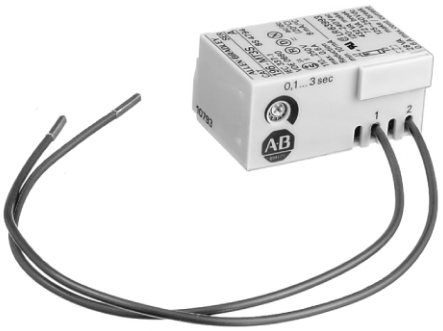


For Use with 700-MB Relays		
Contact Configuration	Pkg. Qty.	Cat. No. ❶
1 N.O.–1 N.C.	10	195-MA11
2 N.O.	10	195-MA20
2 N.C.	10	195-MA02
2 N.O.–2 N.C.	10	195-MA22
4 N.O.	10	195-MA40
1 N.O.–3 N.C.	10	195-MA13
4 N.C.	10	195-MA04

Surge Suppressors

Description		Pkg. Qty.	Cat. No. ❶
R-C Suppressor	24…48V AC	10	199-MSMA48
	110…280V AC	10	199-MSMA1
MOV Suppressor	12…55V AC	10	199-MSMV1
	56…136V AC	10	199-MSMV2
	137…277V AC	10	199-MSMV3
Diode Suppressor	12…250V DC	10	199-MSMD1

Timers



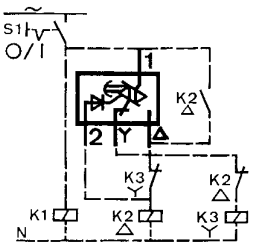
Description		Pkg. Qty.	Cat. No. ❶
Solid State Timing Element 110…250V 50/60 Hz, DC	0.1…3 s On–Delay	10	196-MT3S
	1…30 s On–Delay	10	196-MT30S
Star-Delta Timer 1…30 s The Star (K3) contactor is energized for the time setting and de-energized. Then after 90 ± 30 ms the Delta (K2) contactor is energized.	220…250V 50/60Hz	10	196-MTSDA2
	110…120V 50/60 Hz	10	196-MTSDA1
35 mm DIN Rail Mounting Adapter For Above Timers		10	196-MTM

❶All Cat. Nos. are factory stocked.

Mini-Relays

			Cat. Nos. 700-M… and 700-MB…
Electrical			
Operating Range	AC	Pick-Up	85…110% nominal coil voltage
		Drop-Out	35…65% nominal coil voltage
	DC	Pick-Up	80…110% nominal coil voltage
		Drop-Out	10…25% nominal coil voltage
Coil Consumption	AC	Inrush	22 VA
		Sealed	4 VA
	DC	Inrush	2.5 W
		Sealed	2.5 W
Mechanical			
Operating Time	AC	Pick-Up	15…40 ms
		Drop-Out	15…25 ms
	DC	Pick-Up	18…40 ms
		Drop-Out	6…12 ms
Environmental			
Ambient Temperature	In storage, transport		–55…+80°C (–67…176°F)
	At rated operational current		–50…+60°C (–58…140°F)
	At 85% rated operational current		–50…+70°C (–58…158°F)
Resistance to Climatic Change	Humid heat		40°C (104°F), 95% relative humidity, 56 days
	Alternating climatic conditions		23°C (73.4°F), 83%/40°C (104°F), 93%, 56 cycles
Mounting Position			
Construction			
Protection Class			IP20
Protection Against Accidental Contact			Finger and back-of-hand proof according to VDE 0106, part 100
Terminals	Wire		2 x 0.75…2.5 mm² (#18…14 AWG)
	Stranded lead without connector sleeve		2 x 0.75…2.5 mm² (#18…14 AWG)
	Stranded lead with connector sleeve		2 x 0.75…2.5 mm² (#18…14 AWG)
Weight			700-M = 153 g, 700-MB = 153 g

Timers

Cat. No.		196-M	196-MSD
Electrical			
Operational Voltage		AC and DC 110V –23%…250V +10%	AC only, 50/60 Hz 110V –23%…120V +10% 220V –20%…240V +10%
Voltage Drop		5V maximum	5V maximum
Load current for reliable function		10 mA minimum	10 mA minimum
Load current at20°C (68°F) 40°C (104°F) 55°C (131°F)		600 mA 440 mA 320 mA	600 mA 440 mA 320 mA
Leakage current at 220V		5 mA	Y 17 mA, Δ 6 mA
Time range (delayed operation)		0.1…3 s 1…30 s	1…30 s
Transition time Y/Δ		—	90 ms ± 30 ms
Reset time		≥ 200 ms	≥ 200 ms
Voltage failure duration having no influence on time sequence		≤ 15 ms	≥ 20 ms
Repeat accuracy At fixed temperature With temperature range of –5…+55°C (+23…+131°F)		±1% ±5%	±1% ±5%
Time interval for start commands		1.4 X set time	2 X set time
General			
Functional description		After the set time has expired, the timer completes the circuit and switches on the series connected relay or contactor.	After the set time has expired, contactor KY is switched off, and after the fixed switching interval 90 ± 30 ms, contactor KΔ is switched on.
Circuit diagrams			
Time setting		The 0.1…3 s and 1…30 s delay period is preset by means of the seconds marking and then corrected according to the process sequence or by checking with a stop watch.	
Environmental			
Ambient temperature	Operation	–20…+55°C (–40…+131°F)	–20…+55°C (–40…+131°F)
	Storage	–40…+80°C (–4…+176°F)	–40…+80°C (–40…+176°F)
Construction			
Terminals:0.8 mm² (AWG 18)		2 free cable ends, each 250 mm long	4 free cable ends, each 250 mm long

Surge Suppressors

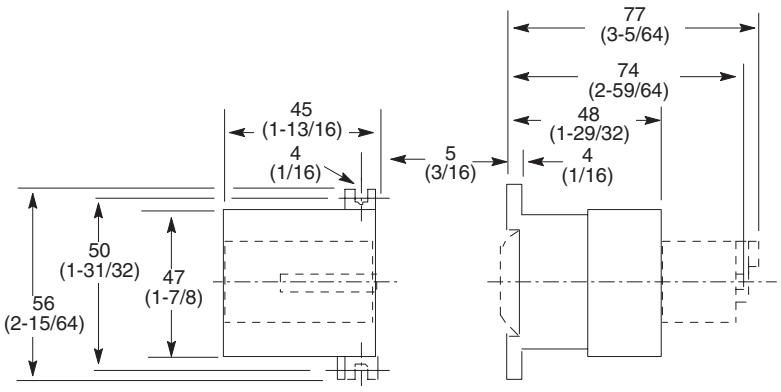
Cat. No.	196-M	196-MSD
Electrical		
Overvoltage factor	n = U_{max}/U_n = 0.8…2.5	

Contact Ratings

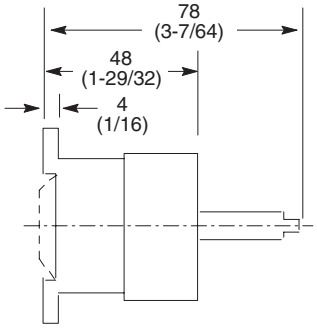
Description							
Cat. No.		700-MB… and Auxiliary Contacts		700-M…			
Rated Thermal Current	I_{th} Open ❶	10 A		16 A			
	I_{th} Enclosed ❶	6 A		12 A			
Contact Ratings Continuous		10 A @ 300V AC NEMA A300 ❷ 2.5 A @ 300V DC NEMA Q300 ❷		10 A @ 600V AC NEMA A600 ❷ 2.5 A @ 600V DC NEMA Q600 ❷			
Make/Break IEC 947 AC-15 (Switching Solenoid)		12…120V 220…240V 360…400V 480…500V	5.0 A 2.5 A 2.0 A 2.0 A	12…120V 220…240V 360…400V 480…500V	10.0 A 6.0 A 2.5 A 1.25 A		
Make/Break IEC 947 DC-13		24V 48V 110V 220V	5.0 A 0.6 A 0.45 A 0.1 A	24V 48V 110V 220V 440V	5.0 A 4.0 A 0.6 A 0.2 A 0.04 A		
Minimum Switching Recommendation		17V, 5 mA		17V, 25 mA			
Rated Voltage Withstand U_i	IEC, AS, BS, ASE, VDE 0660	500V		500V			
	UL, NEMA, CSA, EEMAC	600V		600V			
	IEC 947-4, IEC 158-1	2500V		2500V			
Back-Up Fuse IEC 158-1		10 A		16 A			
Life	Mechanical	10 million operations		10 million operations			
	AC-1 Electrical (230V / 6 A)	0.7 million operations		0.7 million operations			
Continuous Rating		300V 600V	10 A 10 A	300V 600V	12 A 12 A		
DC Switching (DC-1 Slightly Inductive Loads at 60°C)		—			1 pole	2 poles	3 poles
				24/48V	6/4	6.0 A	6.0 A
				110V	0.6 A	4.0 A	6.0 A
				220V	0.2 A	0.8 A	3.0 A
				440V	0.08 A	0.2 A	0.4 A
Certifications		SEV, CEBEC, DEMKO, NEMKO, SEMKO, Finland, Germ. Lloyd, Bureau Veritas, USSR Register, CSA Certified, UL Listed, File E14840					
Standards		IEC 947, BS 5424, 4794, CEE24; SEV 1025, UTE NF C63-110; VDE 0660; CSA C22.2 No. 14; UL 508					

❶ "Open" values refer to 40°C (104°F) ambient temperature. "Enclosed" values refer to 60°C (140°F) ambient temperature.
❷ Refer to page 19 for NEMA Contact Rating information.

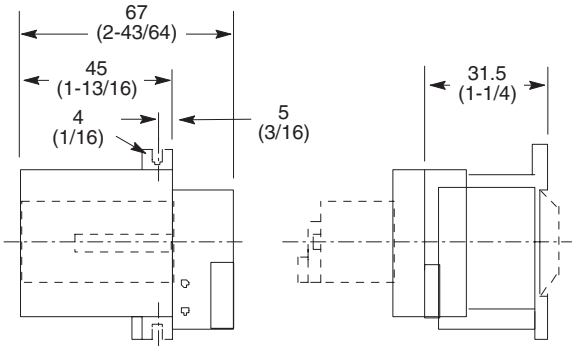
Approximate Dimensions are shown in millimeters (inches). Approximate Dimensions are not intended to be used for manufacturing purposes.



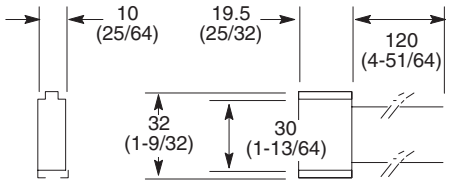
Mini-contactor or mini-relay with auxiliary contact adder deck or timer mounted to front.
Cat. No. 700-M and 700-MB



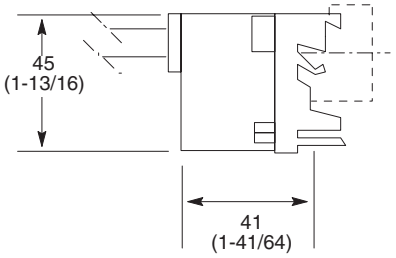
Mini-contactor or mini-relay with surge suppressor mounted to front.
Cat. No. 700-M and 700-MB



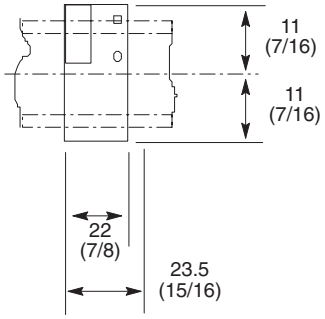
Mini-contactor or mini-relay with auxiliary contact adder deck mounted to front and timer mounted to side
Cat No. 700-M and 700-MB



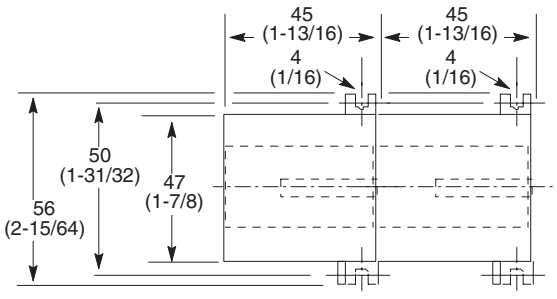
Surge Suppressor
Cat No. 199-MSM



Timer with DIN Rail mounting adapter on 35 mm DIN Rail
Cat. No. 196-MT



Timer with DIN Rail mounting adapter on 35 mm DIN Rail
Cat. No. 196-MT



Mini-contactors or mini-relays latched
Cat. No. 700-ML

Bulletin 700-P Direct Drive™ Convertible Contact Cartridge Relays

- NEMA and IEC Ratings
- Easy Accessory Additions:
  - Adder Decks
  - Time Delay
  - Latching
  - Surge Suppressors
  - Mounting Strip
- Expands Safety Relay Output
- Can Accommodate Ring Tongue Terminals

Table of Contents

Product Selection 211
Accessories 218
Specifications 223
Approximate Dimensions 225

Electrically Held Relays

Bulletin 700-P Standard Contact Cartridge ❶ ❷

AC-Operated Relays

Contacts		Contact Arrangement and Markings	Open Type – Without Enclosure	Type 1 General Purpose Enclosure
N.O.	N.C.		Cat. No. ❶ ❻	Cat. No.
2	—	4-Pole Relay: K1 A1X ❸ A2X A3X A4X ❸ / K2 A1Y A2Y A3Y A4Y	700-P200⊗	700-P201⊗
4	—		700-P400⊗	700-P401⊗
6	—	8-Pole Relay: B1X ❹ B2X B3X B4X ❹ / B1Y B2Y B3Y B4Y	700-P600⊗	700-P601⊗
8	—		700-P800⊗	700-P801⊗
10	—	12-Pole Relay: C1X ❺ C2X C3X C4X ❺ / C1Y C2Y C3Y C4Y	700-P1000⊗	700-P1001⊗
12	—		700-P1200⊗	700-P1201⊗

⊗ AC Voltage Suffix Code

The Cat. No. as listed is incomplete. Select a voltage suffix code from the table below to complete the Cat. No. Example: **Cat. No. 700-P200**⊗ becomes **Cat. No. 700-P200A48**. For other coil voltages, consult your local Allen-Bradley distributor.

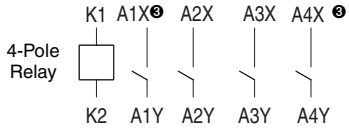
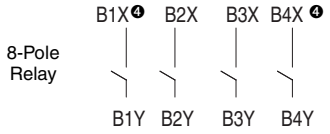
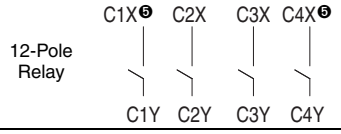
Hz	24	48	110	110-115	115-120	120	127	200-208	220-230	230-240	277	347	380	415	440-480	460-480	500	575-600
50	B24	B48	A1*	B11†	—	—	B27	—	B22	B2	—	—	B3	B41	B44	—	B50	—
60	A24	A48	—	—	A1*	B11†	—	A20	A22	A2	A27	A35	—	—	—	A4	—	A6

*Optimized for 115…120V, 60 Hz. Operates satisfactorily at 110V, 50 Hz.
†Optimized for 110…115V, 50 Hz. Operates satisfactorily at 120V, 60 Hz.

❶ **Normally closed contacts:** The normally open contacts can easily be changed to normally closed in the field. Relays can be supplied with N.C. contacts.
❷ **Overlap contacts:** To order a relay containing one pair: Use **Cat. No. 700-PZ110**. To order a relay containing two pairs: Use **Cat. No. 700-PZ2220**. N.O. contact closes before N.C. contact opens. AC Ratings: NEMA A600, DC Ratings: P150.
❸ Location of contacts in 2-pole relays.
❹ Location of contacts in 6-pole relays: 4-pole relay plus the 2 contacts indicated.
❺ Location of contacts in 10-pole relays: 8-pole relay plus the 2 contacts indicated.
❻ All Cat. Nos. are factory stocked.

Electrically Held Relays

DC-Operated Relays

Contacts❶❷		Contact Arrangement and Markings	Open Type – Without Enclosure	Type 1 General Purpose Enclosure
N.O.	N.C.		Cat. No. ❻	Cat. No. ❻
2	—		700DC-P200⊗	700DC-P201⊗
4	—		700DC-P400⊗	700DC-P401⊗
6	—		700DC-P600⊗	700DC-P601⊗
8	—		700DC-P800⊗	700DC-P801⊗
10	—		700DC-P1000⊗	—
12	—		700DC-P1200⊗	—

⊗ DC Voltage Suffix Code

The Cat. No. as listed is incomplete. Select a voltage suffix code from the table below to complete the Cat. No. Example: **Cat. No. 700DC-P200**⊗ becomes **Cat. No. 700DC-P200Z48**. For other coil voltages, consult your local Allen-Bradley Sales Office.

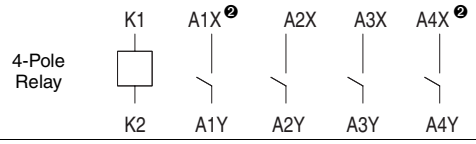
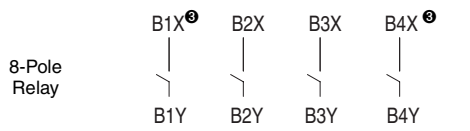
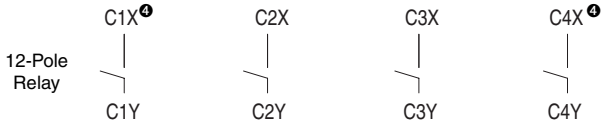
6	12	18	24	32	48	64	72	90	115-125	230-250	500-550	575-600
Z06	Z12	Z18	Z24	Z32	Z48	Z64	Z72	Z90	Z1	Z2	Z5	Z6

❶ **Normally closed contacts:** The normally open contacts can easily be changed to normally closed in the field. Relays can be supplied with N.C. contacts.
❷ **Overlap contacts:** To order a relay containing one pair: Use **Cat. No. 700-PZ110**. To order a relay containing two pairs: Use **Cat. No. 700-PZ2220**. N.O. contact closes before N.C. contact opens. AC Ratings: NEMA A600, DC Ratings: P150.
❸ Location of contacts in 2-pole relays.
❹ Location of contacts in 6-pole relays: 4-pole relay plus the 2 contacts indicated.
❺ Location of contacts in 10-pole relays: 8-pole relay plus the 2 contacts indicated.
❻ All Cat. Nos. are factory stocked.

Electrically Held Relays

Bulletin 700-PK Master Contact Cartridges ❶

AC-Operated Relays

Contacts N.O.	Contacts N.C.	Contact Arrangement and Markings	Open Type – Without Enclosure Cat. No. ❺	Type 1 General Purpose Enclosure Cat. No.
2	—		700-PK200⊗	700-PK201⊗
4	—		700-PK400⊗	700-PK401⊗
6	—		700-PK600⊗	700-PK601⊗
8	—		700-PK800⊗	700-PK801⊗
10	—		700-PK1000⊗	700-PK1001⊗
12	—		700-PK1200⊗	700-PK1201⊗

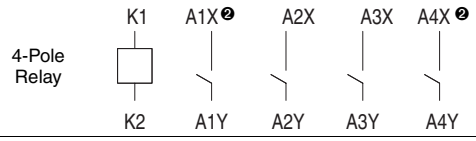
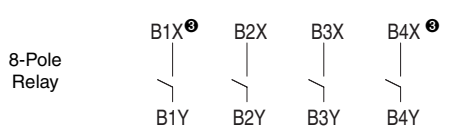
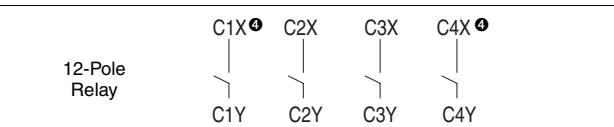
⊗ AC Voltage Suffix Code

The Cat. No. as listed is incomplete. Select a voltage suffix code from the table below to complete the Cat. No. Example: **Cat. No.700-PK200⊗** becomes **Cat. No. 700-PK200A48**. For other coil voltages, consult your local Allen-Bradley Sales Office.

Hz	24	48	110	110-115	115-120	120	127	200-208	220-230	230-240	277	347	380	415	440-480	460-480	500	575-600
50	B24	B48	A1*	B11†	—	—	B27	—	B22	B2	—	—	B3	B41	B44	—	B50	—
60	A24	A48	—	—	A1*	B11†	—	A20	A22	A2	A27	A35	—	—	—	A4	—	A6

*Optimized for 115…120V, 60 Hz. Operates satisfactorily at 110V, 50 Hz.
†Optimized for 110…115V, 50 Hz. Operates satisfactorily at 120V, 60 Hz.

DC-Operated Relays

Contacts N.O.	Contacts N.C.	Contact Arrangement and Markings	Open Type – Without Enclosure Cat. No. ❺	Type 1 General Purpose Enclosure Cat. No.
2	—		700DC-PK200⊗	700DC-PK201⊗
4	—		700DC-PK400⊗	700DC-PK401⊗
6	—		700DC-PK600⊗	700DC-PK601⊗
8	—		700DC-PK800⊗	700DC-PK801⊗
10	—		700DC-PK1000⊗	—
12	—		700DC-PK1200⊗	—

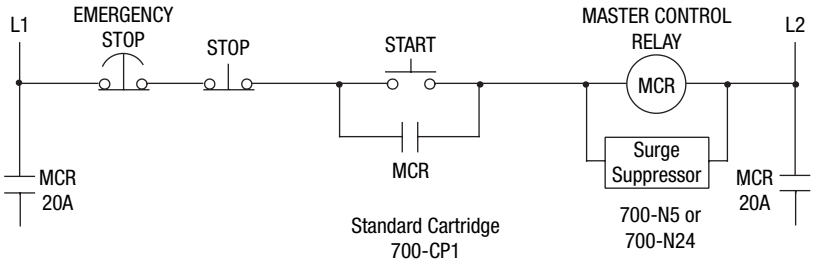
⊗ DC Voltage Suffix Code

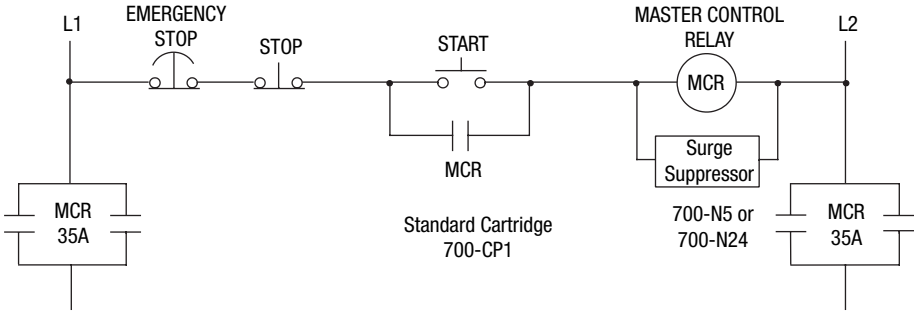
The Cat. No. as listed is incomplete. Select a voltage suffix code from the table below to complete the Cat. No. Example: **Cat. No. 700DC-PK200⊗** becomes **Cat. No. 700DC-PK200Z12**. For other coil voltages, consult your local Allen-Bradley Sales Office

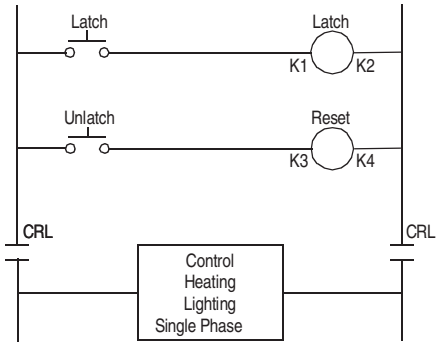
6	12	18	24	32	48	64	72	90	115-125	230-250	500-550	575-600
Z06	Z12	Z18	Z24	Z32	Z48	Z64	Z72	Z90	Z1	Z2	Z5	Z6

❶ **Normally closed contacts:** The normally open contacts can easily be changed to normally closed in the field. Relays can be supplied with N.C. contacts.
❷ Location of contacts in 2-pole relays.
❸ Location of contacts in 6-pole relays: 4-pole relay plus the 2 contacts indicated.
❹ Location of contacts in 10-pole relays: 8-pole relay plus the 2 contacts indicated.
❺ All Cat. Nos. are factory stocked.

Electrically Held Relays — Typical Wiring Diagrams



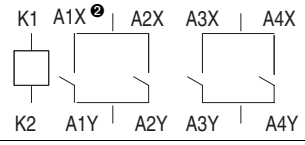
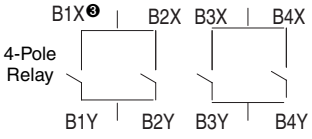
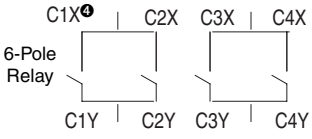




Electrically Held Relays

Bulletin 700-PH 35A Tandem Contact Cartridges ❶ ❷

AC-Operated Relays

	Contacts		Contact Arrangement and Markings	Open Type – Without Enclosure	Type 1 General Purpose Enclosure
	N.O.	N.C.		Cat. No. ❺	Cat. No. ❺
Cat. No. 700-PH200	1	—		700-PH100⊗	700-PH101⊗
	2	—		700-PH200⊗	700-PH201⊗
	3	—		700-PH300⊗	700-PH301⊗
	4	—		700-PH400⊗	700-PH401⊗
	6	—		700-PH600⊗	700-PH601⊗

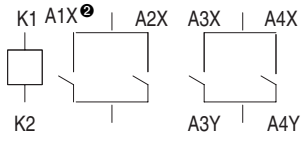
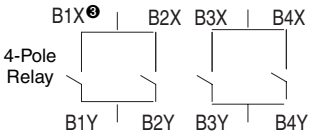
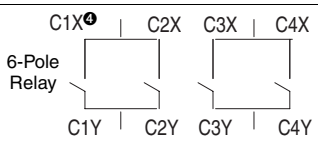
⊗ AC Voltage Suffix Code

The Cat. No. as listed is incomplete. Select a voltage suffix code from the table below to complete the Cat. No. Example: **Cat. No. 700-PH100**⊗ becomes **Cat. No. 700-PH100A48**. For other coil voltages, consult your local Allen-Bradley Sales Office.

Hz	24	48	110	110-115	115-120	120	127	200-208	220-230	230-240	277	347	380	415	440-480	460-480	500	575-600
50	B24	B48	A1*	B11†	—	—	B27	—	B22	B2	—	—	B3	B41	B44	—	B50	—
60	A24	A48	—	—	A1*	B11†	—	A20	A22	A2	A27	A35	—	—	—	A4	—	A6

*Optimized for 115…120V, 60 Hz. Operates satisfactorily at 110V, 50 Hz.
†Optimized for 110…115V, 50 Hz. Operates satisfactorily at 120V, 60 Hz.

DC-Operated Relays

	Contacts		Contact Arrangement and Markings	Open Type – Without Enclosure	Type 1 General Purpose Enclosure
	N.O.	N.C.		Cat. No. ❺	Cat. No.
Cat. No. 700DC-PH200	1	—		700DC-PH100⊗	700DC-PH101⊗
	2	—		700DC-PH200⊗	700DC-PH201⊗
	3	—		700DC-PH300⊗	700DC-PH301⊗
	4	—		700DC-PH400⊗	700DC-PH401⊗
	6	—		700DC-PH600⊗	—

⊗ DC Voltage Suffix Code

The Cat. No. as listed is incomplete. Select a voltage suffix code from the table below to complete the Cat. No. Example: **Cat. No. 700DC-PH200**⊗ becomes **Cat. No. 700DC-PH200Z12**. For other coil voltages, consult your local Allen-Bradley Sales Office.

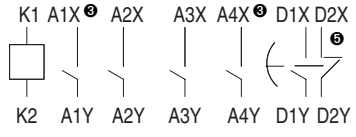
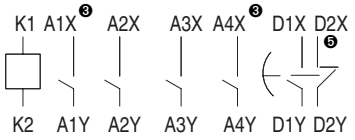
6	12	18	24	32	48	64	72	90	115-125	230-250	500-550	575-600
Z06	Z12	Z18	Z24	Z32	Z48	Z64	Z72	Z90	Z1	Z2	Z5	Z6

❶ **Normally closed contacts:** The normally open contacts can easily be changed to normally closed in the field. Relays can be supplied with N.C. contacts.
❷ Location of contacts in 1-pole relays.
❸ Location of contacts in 3-pole relays: 2-pole relay plus the contact indicated.
❹ Location of contacts in 6-pole relays: 4-pole relay plus the 2 contacts indicated.
❺ All Cat. Nos. are factory stocked.

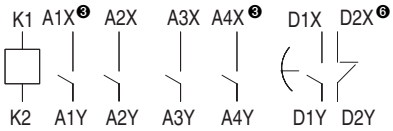
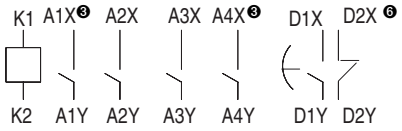
Time Delay Relays — Open Type With Pneumatic Time-Delay Attachment

- Timing Options: (see page 220)
  - Pneumatic Timers — Factory- or Field-Installed
  - Solid-State Timers — Field-Installed
- Factory-Assembled Bulletin 700-PT and PKT Timing Relays
  - 0, 2, or 4 instantaneous contacts
  - 2 timed contacts — both ON Delay or both OFF Delay
  - Convertible from ON Delay to OFF Delay and vice versa
  - Standard contact cartridges rated NEMA A600 (AC) and P600 (DC)
  - Master contact cartridges rated 2X NEMA A600 (AC) and 2X P600 (DC)

Bulletin 700-P Standard Contact Cartridge ❶ ❷

AC-Operated Relays				DC-Operated Relays	
Contacts		Contact Arrangement and Markings	Cat. No. ❹	Contact Arrangement and Markings	Cat. No. ❹
N.O.	N.C.				
0	—	Relay with only time delay contacts	700-PPT⊗	Relay with only time delay contacts	700DC-PPT⊗
2	—		700-PT200⊗		700DC-PT200⊗
4	—		700-PT400⊗		700DC-PT400⊗

Bulletin 700-PK Master Contact Cartridges ❶

AC-Operated Relays				DC-Operated Relays	
Contacts		Contact Arrangement	Open Type Without Enclosure	Contact Arrangement	Open Type Without Enclosure
N.O.	N.C.		Cat. No. ❹		Cat. No. ❹
0	—	Relay with only time delay contacts	700-PPKT⊗	Relay with only time delay contacts	700DC-PPKT⊗
2	—		700-PKT200⊗		700DC-PKT200⊗
4	—		700-PKT400⊗		700DC-PKT400⊗

⊗ AC Voltage Suffix Code

The Cat. No. as listed is incomplete. Select a voltage suffix code from the table below to complete the Cat. No. Example: **Cat. No.700-PKT200⊗** becomes **Cat. No. 700-PKT200A48**. For other coil voltages, consult your local Allen-Bradley Sales Office.

Hz	24	48	110	110-115	115-120	120	127	200-208	220-230	230-240	277	347	380	415	440-480	460-480	500	575-600
50	B24	B48	A1*	B11†	—	—	B27	—	B22	B2	—	—	B3	B41	B44	—	B50	—
60	A24	A48	—	—	A1*	B11†	—	A20	A22	A2	A27	A35	—	—	—	A4	—	A6

*Optimized for 115…120V, 60 Hz. Operates satisfactorily at 110V, 50 Hz.
†Optimized for 110…115V, 50 Hz. Operates satisfactorily at 120V, 60 Hz.

⊗ DC Voltage Suffix Code

The Cat. No. as listed is incomplete. Select a voltage suffix code from the table below to complete the Cat. No. Example: **Cat. No. 700DC-PKT200⊗** becomes **Cat. No. 700DC-PKT200Z12**. For other coil voltages, consult your local Allen-Bradley Sales Office.

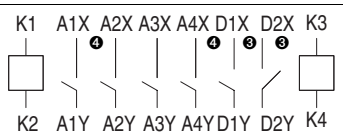
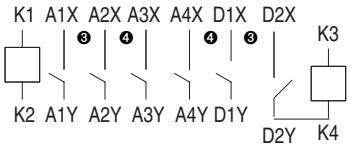
6	12	18	24	32	48	64	72	90	115-125	230-250	500-550	575-600
Z06	Z12	Z18	Z24	Z32	Z48	Z64	Z72	Z90	Z1	Z2	Z5	Z6

❶ **Normally closed contacts:** The normally open contacts can easily be changed to normally closed in the field. Relays can be supplied with N.C. contacts.
❷ **Overlap contacts:** N.O. contact closes before N.C. contact opens. To order a relay containing one pair: Use **Cat. No. 700-PTZ110**. To order a relay containing two pairs: Use **Cat. No. 700-PTZ2220**. AC Ratings: NEMA A600, DC Ratings: P150.
❸ Location of contacts in 2-pole relays.
❹ All Cat. Nos. are factory stocked.
❺ Timer has 1 N.O. and 1 N.C. convertible cartridge in addition to the instantaneous cartridges on the relay. Timer is supplied as On-Delay. Convertible to Off-Delay in the field.
❻ The timer has 1 N.O. and 1 N.C convertible master cartridge in addition to the instantaneous master cartridges on the relay. Timer is supplied as On-Delay. It is convertible to Off-Delay in the field.

Mechanical Latching Relays

- Mechanical latch options — factory- or field-installed
- Converts all poles to latching
- AC latch coil — max. 6 poles latching
- DC latch coil — max. 5 poles latching
- Latching relays have 2 coils — latch coil is the relay coil, reset coil is on the latch attachment
- Latch/reset coils can have 2 AC coils, 2 DC coils, or 1 AC and 1 DC coil (e.g., latch with AC power, unlatch with DC battery)

Bulletin 700-P Standard Contact Cartridge ❶ ❷

AC-Operated Relays				DC-Operated Relays		
Contacts		Contact Arrangement and Markings	Open Type with Mechanical Latch Attachment (Read ATTENTION Below)	Contact Arrangement and Markings		Open Type with Mechanical Latch Attachment (Read ATTENTION Below)
N.O.	N.C.		Cat. No. ❺			Cat. No. ❺
0	—	—	—	—		—
2	—		700-PL200⊗			700DC-PL200⊗
4	—		700-PL400⊗			700DC-PL400⊗
6	—	6-pole Relay	700-PL600⊗	5-pole Relay		700DC-PL500⊗

⊗ AC Voltage Suffix Code

The Cat. No. as listed is incomplete. Select a voltage suffix code from the table below to complete the Cat. No. Example: **Cat. No. 700-PT200**⊗ becomes **Cat. No. 700-PT200A48**. For other coil voltages, consult your local Allen-Bradley Sales Office.
Relays with latch attachments: if the latch attachment coil is to be a different voltage other than the relay coil, add a second coil code suffix. Example: **Cat. No. 700-PL400A1A24**. Only one suffix is required if both coils are the same voltage.

Hz	24	48	110	110-115	115-120	120	127	200-208	220-230	230-240	277	347	380	415	440-480	460-480	500	575-600
50	B24	B48	A1*	B11†	—	—	B27	—	B22	B2	—	—	B3	B41	B44	—	B50	—
60	A24	A48	—	—	A1*	B11†	—	A20	A22	A2	A27	A35	—	—	—	A4	—	A6

*Optimized for 115…120V, 60 Hz. Operates satisfactorily at 110V, 50 Hz.
†Optimized for 110…115V, 50 Hz. Operates satisfactorily at 120V, 60 Hz.

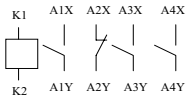
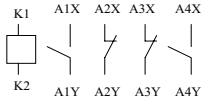
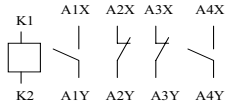
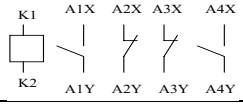
⊗ DC Voltage Suffix Code

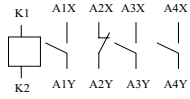
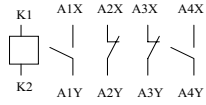
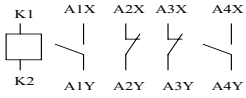
The Cat. No. as listed is incomplete. Select a voltage suffix code from the table below to complete the Cat. No. Example: **Cat. No. 700DC-PT200**⊗ becomes **Cat. No. 700DC-PT200Z12**. For other coil voltages, consult your local Allen-Bradley Sales Office.

6	12	18	24	32	48	64	72	90	115-125	230-250	500-550	575-600
Z06	Z12	Z18	Z24	Z32	Z48	Z64	Z72	Z90	Z1	Z2	Z5	Z6

❶ **Normally closed contacts:** The normally open contacts can easily be changed to normally closed in the field. Relays can be supplied with N.C. contacts.
❷ **Overlap contacts:** To order a relay containing one pair: Use **Cat. No. 700-PTZ110**. To order a relay containing two pairs: Use **Cat. No. 700-PTZ2220**. N.O. contact closes before N.C. contact opens. AC Ratings: NEMA A600, DC Ratings: P150.
❸ Location of contacts in 2-pole relays.
❹ Location of contacts in 4-pole relays: 2-pole relay plus the 2 contacts indicated.
❺ All Cat. Nos. are factory stocked.
ATTENTION – An open or failed unlatch control circuit will fail to unlatch the relay. For this reason, a mechanical latch unit should not be used where protection is needed against automatic restart after a power failure or where reliability to a control function is critical to safety.

700S-P Safety Control Relays ❶ ❷

Contacts		Contact Arrangements and Markings	Relays with 120V AC Coils
N.O.	N.C.		Cat. No. ❸
3	1		700S-P310A1
2	2		700S-P220A1
6	2		700S-P620A1
5	3		700S-P530A1

Contacts		Contact Arrangements and Markings	Relays with 24V DC Coils
N.O.	N.C.		Cat. No. ❸
3	1		700S-DCP310Z24
2	2		700S-DCP220Z24
6	2		700S-DCP620Z24
5	3		700S-DCP530Z24

Accessories ❹

	Description	Continuous Carrying Current (A)	Product Label	Pkg. Qty.	Cat. No. ❸
	10 A cartridge meeting IEC 947-5 ❶ Note: Use this cartridge when full compliance to IEC 947-5 is required. 700-P relays equipped with CPS cartridges fully meet the IEC 947-5 spec for mechanically linked contacts.	10		1	700-CPS

❶ IEC 947-5-1 Annex L has 2 requirements for a relay to meet for mechanically linked contacts:
1.) If a N.O. contact welds, all the N.C. contacts will remain open and meet a 2500V impulse test.
2.) If a N.C. contact welds, all the N.O. contacts will remain open and meet a 2500V impulse test.
700S-P and 700S-DCP relays meet these requirements including the 2500V impulse test.

❷ The relays shown on this page are shipped from the factory with the 700-CPS cartridge installed. Relays with factory-installed 700-CPS cartridges have the IEC international symbol (shown below) for mechanically-linked contacts prominently displayed on a red faceplate.

❸ All Cat. Nos. are factory stocked.

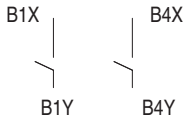
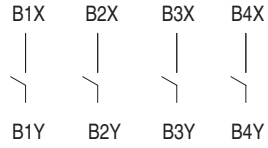
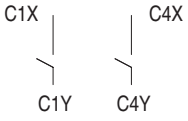
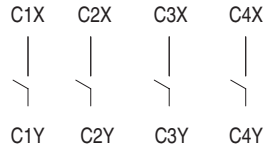
❹ 700S-P and 700S-DCP relays have no accessories.

International Symbol for Mechanically Linked Contacts	

Adder Decks

Second Deck
Cat. No. 700-PB40

Third Deck
Cat. No. 700-PC40

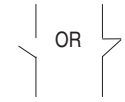
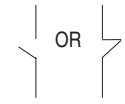
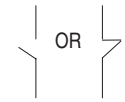
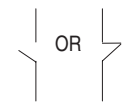
Description	Contacts			Arrangement	Cat. No. ❷
	N.O.	N.C.	Continuous Carrying Current (A)		
Second Deck (2-pole)	2	—	10		700-PB20
	2	—	20		700-PKB20
Second Deck (4-pole)	4	—	10		700-PB40
	4	—	20		700-PKB40
Third Deck (2-pole)	2	—	10		700-PC20
	2	—	20		700-PKC20
Third Deck (4-pole)	4	—	10		700-PC40
	4	—	20		700-PKC40

Contact Cartridges (Convertible from N.O. to N.C. and N.C. to N.O.)

Standard Contact Cartridge
Cat. No. 700-CP1, -CP11Z

Master Contact Cartridge
Cat. No. 700-CPM

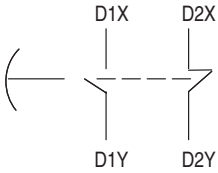
Logic Reed Cartridge
Cat. No. 700-CPR

Description		Continuous Carrying Current (A)	Arrangement	Pkg. Qty.	Cat. No. ❷
Standard Contact Cartridge AC Rating NEMA A600 DC Rating NEMA P600		10		1	700-CP1
Overlap Contact Cartridges ❶ Overlapping Used in pairs. N.O. contact closes before N.C. contact opens on pick-up and vice versa on drop-out.	AC Rating NEMA A600	10		2	700-CP11Z
	DC Rating NEMA P150 125V DC, 138 VA Make and Break	5			
Master Contact Cartridge AC Rating Twice NEMA A600 DC Rating Twice NEMA P600		20		1	700-CPM
Logic Reed Cartridge for Low Energy Circuits ❶ 150V AC 500 mA 25 VA Max. 30V DC 200 mA 6 W Max.	Maximum 150V AC	500 mA		1	700-CPR
	Maximum 30V DC	200 mA			

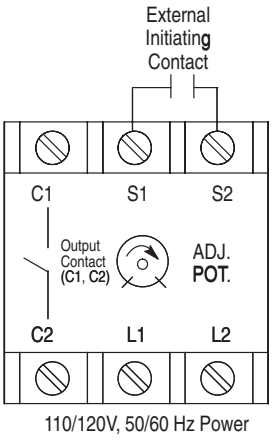
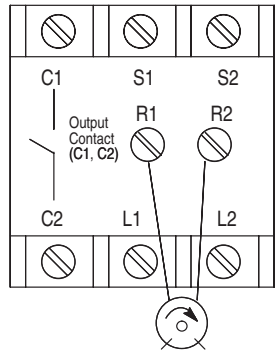
❶ Not Direct Drive.
❷ All Cat. Nos. are factory stocked.

Pneumatic Time-Delay Unit – 1 N.O. and 1 N.C. Convertible Contact Cartridge ❶

Pneumatic Time-Delay

Description			Continuous Carrying Current (A)	Arrangement	Timing Range	Open Type Without Enclosure
Mode	Contacts N.O.	Contacts N.C.				Cat. No. ❷
On-Delay/ Off-Delay	1	1	10		0.1…60 s.	700-PT
			20			700-PKT

Bulletin 700-PS and -PSR Solid-State Timers

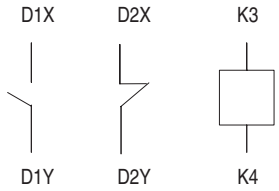
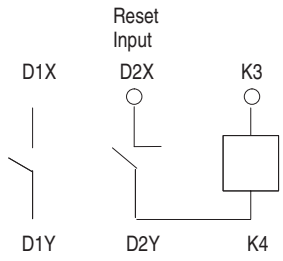
Description	Continuous Carrying Current (A)	Arrangement	Timing Range ❸	Cat. No. ❷
Self-Contained Potentiometer On-Delay	5	 110/120V, 50/60 Hz Power	0.1…2 s	700-PSAA1
			0.4…8 s	700-PSBA1
			1.5…30 s	700-PSCA1
			6…120 s	700-PSDA1
Off-Delay			0.1…2 s	700-PSPA1
			0.4…8 s	700-PSRA1
			1.5…30 s	700-PSTA1
			6…120 s	700-PSUA1
External Potentiometer On-Delay	5	 Remote Pot. Max. Shielded Cable Length 50 FT UL Style #2517 or Equivalent	0.1…2 s	700-PSRAA1
			0.4…8 s	700-PSRBA1
			1.5…30 s	700-PSRCA1
			6…120 s	700-PSRDA1
Off-Delay			0.1…2 s	700-PSRPA1
			0.4…8 s	700-PSRRA1
			1.5…30 s	700-PSRTA1
			6…120 s	700-PSRUA1

❶ Mounts on 4-pole Bulletin 700-P or -PK relay or 2-pole Bulletin 700-PH relay.
❷ All Cat. Nos. are factory stocked.Maximum time may be 50% greater and the minimum time may be 50% less than the value specified.
❸ Maximum time may be 50% greater and the minimum time may be 50% less than the value specified.

Remote Potentiometers for Cat. No. 700-PSR…

Timing Range (s)	Resistance (MΩ)	Cat. No.
0.1…2	0.75	700-N35
0.4…8	0.75	700-N35
1.5…30	2.0	700-N36
6…120	3.5	700-N37

Mechanical Latch Units

Description	Arrangement	Continuous Carrying Current (A)	Open Type Without Enclosure Cat. No. ❶
AC-Operated Latch Units		Without	700-PLL⊗
		10	700-PLL11⊗
		20	700-PKLL11⊗
DC-Operated Latch Units		Without	700DC-PLL⊗
		10	700DC-PLL10⊗
		20	700DC-PKLL10⊗

⊗ AC Voltage Suffix Code

The Cat. No. as listed is incomplete. Select a voltage suffix code from the table below to complete the Cat. No. Example: **Cat. No. 700-PLL⊗** becomes **Cat. No. 700-PLLA1**. For other coil voltages, consult your local Allen-Bradley Sales Office.

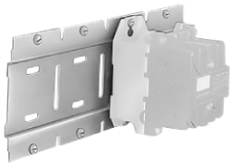
Hz	24	48	110	110-115	115-120	120	127	200-208	220-230	230-240	277	347	380	415	440-480	460-480	500	575-600
50	B24	B48	A1*	B11†	—	—	B27	—	B22	B2	—	—	B3	B41	B44	—	B50	—
60	A24	A48	—	—	A1*	B11†	—	A20	A22	A2	A27	A35	—	—	—	A4	—	A6

*Optimized for 115…120V, 60 Hz. Operates satisfactorily at 110V, 50 Hz.
†Optimized for 110…115V, 50 Hz. Operates satisfactorily at 120V, 60 Hz.

⊗ DC Voltage Suffix Code

The Cat. No. as listed is incomplete. Select a voltage suffix code from the table below to complete the Cat. No. Example: **Cat. No. 700DC-PLL⊗** becomes **Cat. No. 700DC-PLLZ12**. For DC Coils, see page 215. For other coil voltages, consult your local Allen-Bradley Sales Office.

6	12	18	24	32	48	64	72	90	115-125	230-250	500-550	575-600
Z06	Z12	Z18	Z24	Z32	Z48	Z64	Z72	Z90	Z1	Z2	Z5	Z6

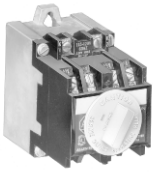


Mounting Strip
Cat. No. 700-MP4

Cat. No. 700-N31

Description	Relays Per Strip	Pkg Qty.	Cat. No. ❶
Universal Mounting Strips – Accepts Bulletin 700-P, -PH, -PK, -R, -RM, and -N control relays, as well as Bulletin 700-RTC timing relays. These strips are easily cut to the required length and bolted, riveted, or spot-welded in place. Relays are installed adjacent to one another on the mounting strip with the captive mounting screws provided. 5 strips/package.	4	5	700-MP4
	8	5	700-MP8
	12	5	700-MP12
	16	5	700-MP16
Type 1 Enclosure – Use for all Bulletin 700-P, -PH and -PK relays except 10- and 12-pole DC relays or 5- and 6-pole DC Bulletin 700-PH relays. Order electrically held relays (Bulletin 700-P, -PH, or -PK) in a NEMA Type 1 enclosure directly from the tables on pages 212…215. This enclosure is also suitable for Bulletin 700-RTC timing relays.		1	700-N31
Type 4/4X Enclosure – For 2- and 4-pole Bulletin 700-P, -PH, -N and -R relays and 2-pole Bulletin 700-PH relays.		1	700-N39
Type 7 & 9 Enclosure – For 2- and 4-pole Bulletin 700-P, -PK, -N and -R relays and 2-pole Bulletin 700-PH relays. 1 conduit hub; top and bottom.		1	700-N33

❶ All Cat. Nos. are factory stocked.

	Description		Pkg. Qty.	Cat. No. ❶
Surge Suppressor ***Cat. No. 700-N5*** *Surge Suppressor* ***Cat. No. 700-N24***	**Surge Suppressors (RC Circuit) –** Surge suppressors reduce the high transient voltages generated when the coil circuit is opened. These suppressors can be used with Bulletin 700-P, -PH, -PK and -N relays, and other electromechanical devices. They contain a resistor and capacitor. Maximum ratings: 150V, AC or DC, 35 VA. Cat. No. 700-N5 requires 1 in. additional depth of enclosure.	Mounting behind relay	1	700-N5
		Mounting on coil terminal	1	700-N24
Surge Suppressor ***Cat. No. 199-FSMA1***	**MOV Surge Suppressors** Used on Bulletin 700-P, -PH, -PK, -N, -F, -R (DC Only) and -RM (DC Only) relays. Mounting on coil terminal. *1 J = 1 V x 1 A x 1 s*	24…48V AC/DC 15 J	1	199-FSMA9
		50…120V AC/DC 15 J	1	199-FSMA10
		130…250V AC/DC 23 J	1	199-FSMA11
	Diode Surge Suppressor – for 6…300V DC voltage coils. Used on Bulletin 700-P, -PH, -PK, -N, -F, and -R relays.		1	199-FSMZ-1
35A Jumper Kit ***Cat. No. 700-CPH*** *Jumper* ***Cat. No. 700-N3*** *Jumper* ***Cat. No. 700-N4***  *Check Out Tool* ***Cat. No. 700-N23***	**35 A Jumper Kit –** CSA Approved, UL Listed This 35 A Jumper Kit can be used with any Bulletin 700-P and -PK AC or DC relay, Time-Delay relay or Latch Unit equipped with 20 A Master Cartridges. It does not require any additional panel space. Jumper Kit terminals are designed for one #8 AWG wire or two #10 AWG wires. When connecting the two 20 A Master Cartridges in parallel, it is important that they be the same configuration (Normally Open or Normally Closed). Jumpers can be added to any contact cartridge location on a relay except the two center poles because of the wide spacing. An adhesive label is included with each kit listing the contact ratings.		1	700-CPH
	Jumpers (Not applicable for Bulletin 700-PH or -PK relays) – For connection between a middle pole and an outer pole on the left or right side of the relay.	**Jumper –** For outer poles	50	700-N3
	Jumpers (Not applicable for Bulletin 700-PH or -PK relays) – For connection between two middle poles.	**Jumper –** For middle poles		700-N4
	Check Out Tool – Mechanically holds the Bulletin 700-P, -PH or -PK relay in the operated position for troubleshooting purposes.		1	700-N23
	Adapter Plate – Simplified relay conversion. Allows you to use the existing mounting holes when you replace a Bulletin 700-B, -BR, -BX or -D relay with a Bulletin 700-P, -PH, or -PK relay.			700-N34
	Protective Cover – For 700-PT Timing Adjustment Knob. Helps prevent tampering with time setting.		5	700-N38

❶ All Cat. Nos. are factory stocked.

Type		700-P, PLL, PT						700-PK, PKLL, PKT						700-PH					
Electrical																			
Contact Rating Continuous		10 A @ 600V AC 5 A @ 600V DC						20 A @ 600V AC 10 A @ 600V DC						35 A @ 600V AC 20 A @ 600V DC					
Ratings Make/Break	AC	NEMA A600						2 x NEMA A600						2 x NEMA A600					
	DC	NEMA P600						2 x NEMA P600						2 x NEMA P600					
Additional Contact Ratings for AC single-phase loads		—						3 Hp @ 240V AC - N.O. 2 Hp @ 240V AC - N.O./N.C. 1 Hp @ 120V AC - N.O./N.C. 20 A Resistive Heating to 600V AC 20 A Tungsten Lighting Load to 480V AC						5 Hp @ 240V AC - N.O. 3 Hp @ 240V AC - N.O./N.C. 2 Hp @ 120V AC - N.O./N.C. 35 A General Use At 0.75 PF to 600V AC 35 A Tungsten Lighting Load to 480V AC					
DC Current Ratings Make/Break		Cartridge Cat. No. 700-CP1						Cartridge Cat. No. 700-CPM						Cartridge Cat. No. 700-CPH					
		Volts DC																	
	Contacts in Series	**24**	**64**	**125**	**250**	**500**	**600**	**24**	**64**	**125**	**250**	**500**	**600**	**24 480W**	**64 480W**	**125 275W**	**250 138W**	**500 135W**	**600 120W**
DC Switching	1	5 A	2.2 A	1.1 A	.55 A	.24 A	.2 A	10 A	5 A	2.2 A	.55 A	.24 A	.2 A	10 A	5 A	2.2 A	.55 A	.24 A	.2 A
	2	10 A	10 A	5 A	2 A	.7 A	.5 A	20 A	10 A	5 A	2 A	.7 A	.5 A	20 A	10 A	5 A	2 A	.7 A	.5 A
	3	—	—	7 A	3 A	1.5 A	1.0 A	—	15 A	7 A	3 A	1.5 A	1.0 A	—	15 A	7 A	3 A	1.5 A	1.0 A
	4	—	—	10 A	5 A	2.5 A	1.5 A	—	20 A	10 A	5 A	2.5 A	1.5 A	—	20 A	10 A	5 A	2.5 A	1.5 A
Coil Voltage Range	AC	85…110%						85…110%						85…110%					
	DC	80…110%						80…110%						80…110%					
	Battery Charging	85…115%						85…115%						85…115%					
		50 Hz			**60 Hz**			**50 Hz**			**60 Hz**			**50 Hz**			**60 Hz**		
Coil Consumption P-PH-PK	A Inrush	132 VA			138 VA			132 VA			138 VA			132 VA			138 VA		
	C Sealed	19.3 VA			19 VA			19.3 VA			19 VA			19.3 VA			19 VA		
	D Inrush	12.7 VA						12.7 VA						12.7 VA					
	C Sealed	12.7 VA						12.7 VA						12.7 VA					
PLL - PKLL	Inrush	15 VA			15.6 VA			5 VA			15.6 VA			15 VA			15.6 VA		
AC Latch Unit	Sealed	5.4 VA			5.5 VA			5.4 VA			5.5 VA			5.4 VA			5.5 VA		
PLL - PKLL	Unlatch	35 VA						35 VA						35 VA					
DL Latch Unit	Intermittent	35 W						35 W						—					
Reset Time	PT – PKT	75 ms						75 ms						—					
Minimum Pulse	PLL–PKLL	75 ms						75 ms						—					
Mechanical																			
Operating Time	Pickup	AC – 10…20 ms DC – 30…50 ms						AC – 10…20 ms DC – 30…50 ms						AC – 10…20 ms DC – 30…50 ms					
	Dropout	AC – 10…20 ms DC – 20…33 ms						AC – 10…20 ms DC – 20…33 ms						AC – 10…20 ms DC – 20…33 ms					
Mechanical Life		10 million operations																	
Construction																			
Contact Arrangement		Up to 12 Poles, Convertible to N.O. or N.C. (8 N.C. Maximum)						Up to 12 Poles, Convertible to N.O. or N.C. (8 N.C. Maximum)						Up to 6 Poles, Convertible to N.O. or N.C. (4 N.C. Maximum)					
Contact Material		Nickel Silver						Silver Cadmium Oxide						Silver Cadmium Oxide					
Mounting		Panel or Strip Mount Horizontal Mounting Recommended						Panel or Strip Mount Horizontal Mounting Recommended						Panel or Strip Mount Horizontal Mounting Recommended					
Environmental																			
Temperature	Operating ❶	–20…+65°C (–4…149°F)						–20…+65°C (–4…149°F)						–20…+65°C (–4…149°F)					
	Storage	–40…+65°C (–40…149°F)						–40…+65°C (–40…149°F)						–40…+65°C (–40…149°F)					
Certifications		CSA Certified, CSA File #LR1234, UL Listed, UL File #E14840, Guide NKCR, CE Certified																	
Standards		IEC 947-5-1, IEC 337-1 CENELEC, BS 4794, VDE 0660, Listed: U.S. Coast Guard and American Bureau of Shipping, UL508, CSA 22.2																	

❶ Temperature inside the panel.

Operating Coils

Bulletin 700 Bulletin 700-P-PH-PK Relays — Bulletin 700-PLL-PKLL Mechanical Latch Attachments ❶

Bulletin 700-P Operating Coil

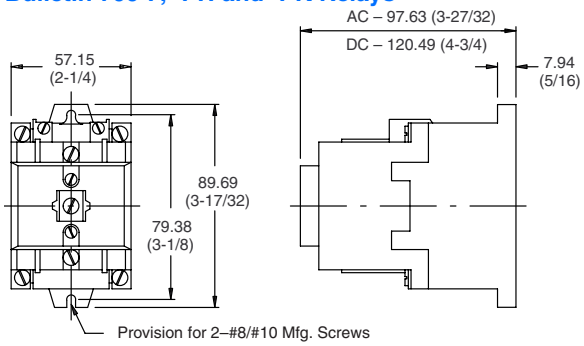
Bulletin 700-PL Unlatch Coil and Magnet Assembly

Coil Volts	Bulletin 700-P, -PK 2-…12-pole, Bulletin 700-PH 1-…6-pole AC		Bulletin 700-PLL–PKLL AC Mechanical Latch Attachment		Bulletin 700-P-PK 2-…12-pole, Bulletin 700-PH 1-…6-pole DC
	60 Hz	50 Hz	60 Hz	50 Hz	—
24	PA013	PA407	PL013	PL407	PD714
32	—	—	—	—	PD718
48	PA222	PA314	PL222	PL314	PD724
110 ❷	—	PA236	—	PL236	PD733 ❹ (100…110)
115…120 ❷	PA236	—	PL236	—	—
110…115 ❸	—	PA322	—	PL322	—
115…125	—	—	—	—	PD735
120 ❸	PA322	—	PL322	—	—
130…140	—	—	—	—	PD738
200…208	PA249	—	PL249	—	—
220…230	PA251	PA339	—	PL339	—
230…240	PA254	PA342	PL254	PL342	—
230…250	—	—	PD748	—	PD748
277	PA260	—	—	—	—
380	—	PA354	—	PL354	—
415	—	PA357	—	PL357	—
440…460	—	PA360	—	PL360	—
460…480	PA273	—	PL273	—	—
500	—	PA364	—	PL364	PD759
575…600	PA273	—	PL278	—	PD758

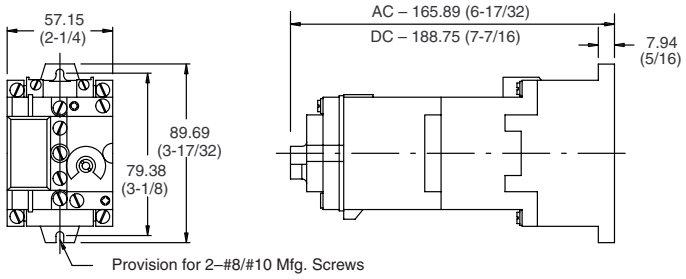
❶ Coils for AC relays cannot be used in DC relays and vice versa.
❷ This coil is optimized for 115…120V, 60 Hz applications and will operate satisfactorily at 110V, 50 Hz.
❸ This coil is optimized for 110…115V, 50 Hz applications and will operate satisfactorily at 120V, 60 Hz.
❹ This coil is designed and marked for use at 100…110V DC.

Approximate Dimensions in millimeters (inches). Approximate Dimensions are not intended to be used for manufacturing purposes.

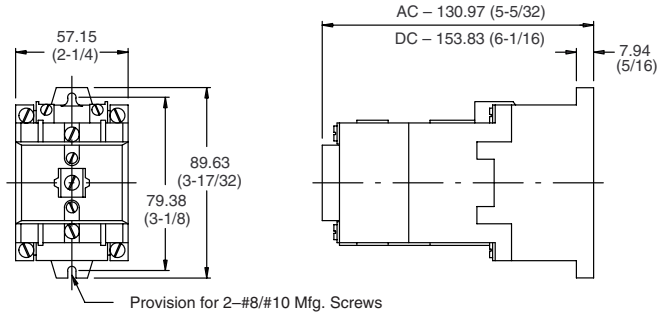
Bulletin 700-P, -PH and -PK Relays



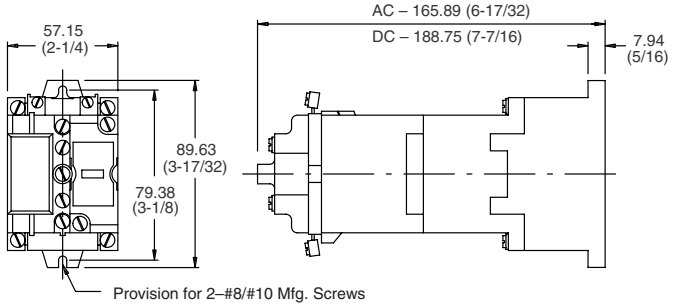
2- and 4-pole Bulletin 700-P or -PK Relay — 2-pole Bulletin 700-PH Relay
Approximate Shipping Weight AC – 0.68 kg (1.5 lbs.),
DC – 1.34 kg (2.95 lbs.)



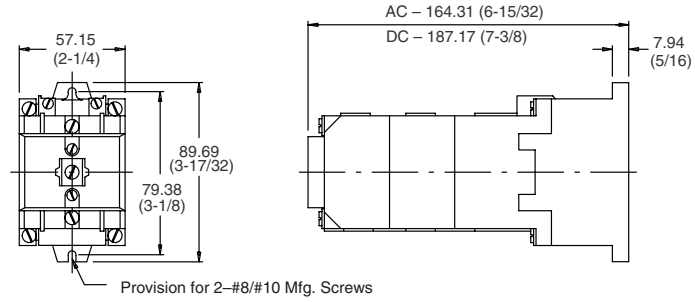
2- and 4-pole Bulletin 700-P or -PK Relay or 2-pole Bulletin 700-PH Relay
with Pneumatic Time Delay Attachment
Approximate Shipping Weight AC – 0.85 kg (1.88 lbs.),
DC – 1.5 kg (3.33 lbs.)



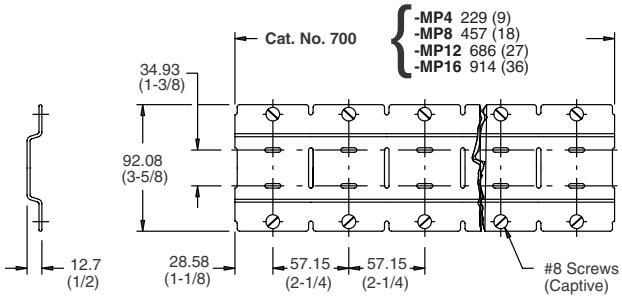
6- and 8-pole Bulletin 700-P or -PK Relay — 4-pole Bulletin 700-PH Relay
Approximate Shipping Weight AC – 0.79 kg (1.75 lbs.),
DC – 1.45 kg (3.20 lbs.)



2- and 4-pole Bulletin 700-P or -PK Relay or 2-pole Bulletin 700-PH Relay
with Mechanical Latch Attachment
Approximate Shipping Weight AC – 0.97 kg (2.13 lbs.),
DC – 1.62 kg (3.58 lbs.)

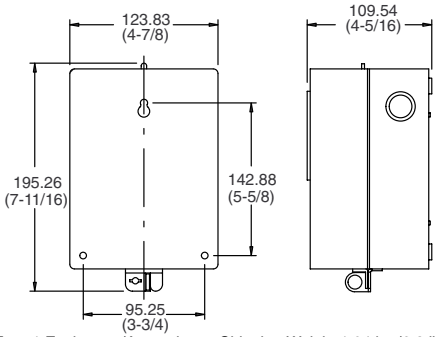


10- and 12-pole Bulletin 700-PPK Relay — 6-pole Bulletin 700-PH Relay
Approximate Shipping Weight AC – 1.02 kg (2.25 lbs.),
DC – 1.68 kg (3.7 lbs.)

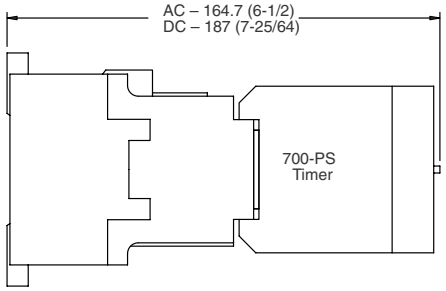


Universal Mounting Strip for Bulletin 700-P, -PH, -PK, -N, -NM, -R,
-RM, -RT, -RTA Relays

Secure the mounting strip with 2 screws at each end relay position.
Use a minimum of one screw at the 3rd, 5th, 7th, etc., relay positions.
Alternate between upper and lower horizontal slots.



Type 1 Enclosure (Approximate Shipping Weight 1.04 kg (2.3 lb.)
for Bulletin 700-P or -PK Relay (2…4-pole);
Bulletin 700-PH Relay (1…2-pole only);
Cat. No. 700-N31 NEMA Type 1 Enclosure for other Bulletin 700-P, -PH, -PK, -RTC Relays has
same Approximate Dimensions except the depth is 178 mm (7").
Approximate Shipping Weight 1.26 kg (2.8 lb.)



Bulletin 700-PS Timer Mounted on a 4-pole Bulletin 700 Bulletin 700-P or
-PK Relay or 2-pole Bulletin 700-PH Relay.
Approximate Shipping Weight AC – 0.68 kg (1.5 lbs.) without 700-PS,
eDC – 1.34 kg (2.9 lbs.) without 700-PS

Bulletin 700-ZP

- Adjustable Function and Timing Range Timing Relays
- DIN Rail Mounted Without Cost of Socket
- 17.5 mm wide, Multi-Function or Single Function
- Available as 1 N.O. or SPDT Contact Output
- Timing Ranges From 0.05 s...10.0 h
- Approvals: UL Listed: To U.S. and Canadian Safety Standards, File E14840 CE Certified
- Conformity to Standards: NEMA B300, C600, NEMA P300

Table Of Contents

Product Selection 226
Specifications 227
Approximate Dimensions . 228

Convertible Contacts

Cat. No. 700-ZP100A1

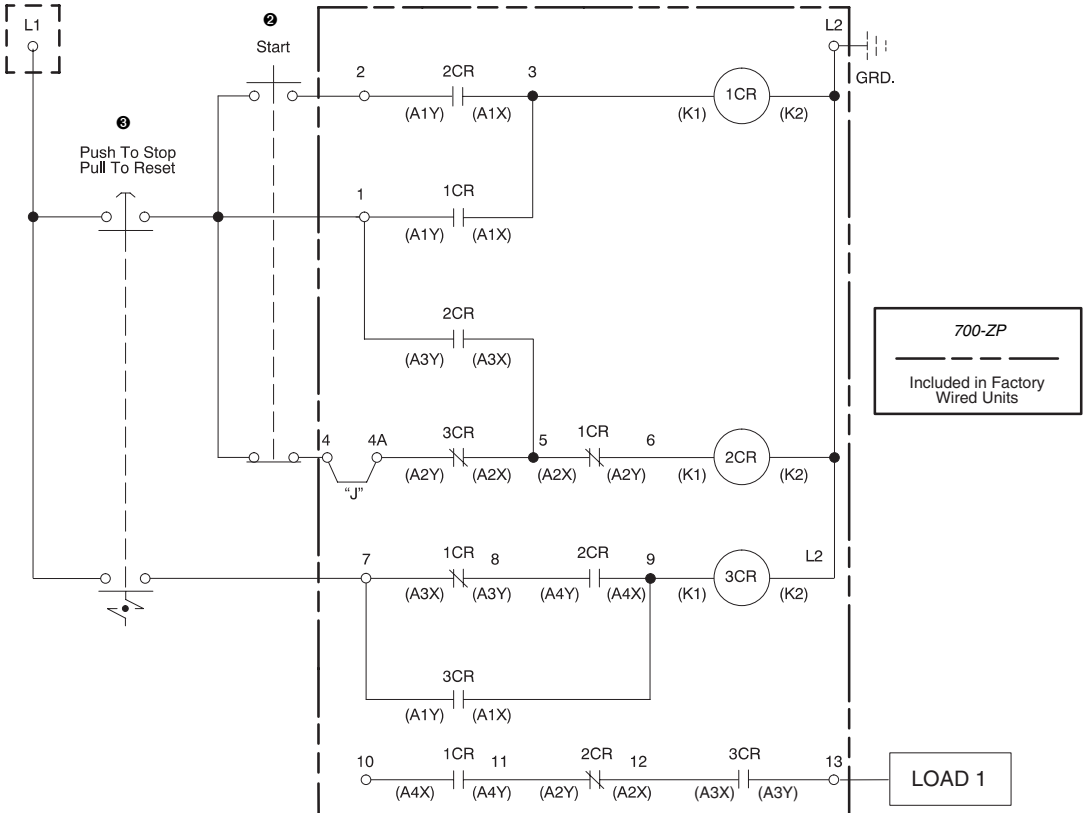
Description	Output	Cat. No. ❷
AC Relays ❶		
Basic Circuit (120V AC)	1 – Monitored	700-ZP100A1
Basic Circuit Using 8-Pole Relays (120V AC)	5 – Monitored	700-ZP500A1
Basic Circuit Using 12-Pole Relays (120V AC)	8 – Monitored	700-ZP800A1
DC Relays ❶		
Basic Circuit (24V DC)	1 – Monitored	700-ZP100Z24
Basic Circuit Using 8-Pole Relays (24V DC)	5 – Monitored	700-ZP500Z24
Basic Circuit Using 12-Pole Relays (24V DC)	8 – Monitored	700-ZP800Z24

❶ For voltages other than the 120V AC or 24V DC, see page 233 for options and voltage codes.
❷ All Cat. Nos. are factory stocked.

Schematic Diagram 700-ZP Relays ❶

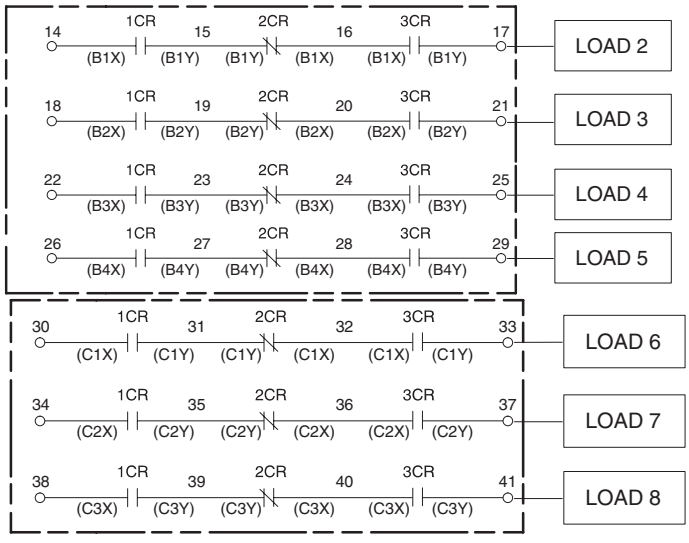
Basic Circuit

700-ZP100 – (1) Output Circuit (3 Relays, 9 Terminal Blocks)



700-ZP500 – (5) Output Circuit (3 Relays, 17 Terminal Blocks)

- Basic circuit plus the additional outputs shown.
- Contact cartridges
  - 10 A 700-CP1
  - 20 A 700-CPM



700-ZP800 – (8) Output Circuit (3 Relays, 23 Terminal Blocks)

- 5 output circuit plus the additional outputs shown.

❶ Self-Monitoring Relay Assemblies can not include 700-CPR (Logic Reed) or 700-CP11Z (Overlapping) contacts.
❷ Push Button using (1) XA Contact Block.
❸ Push Button using (2) XD2 Contact Blocks (diagram shown in Stopped/Open position).
Note: Customer-installed control circuit. ❷❸

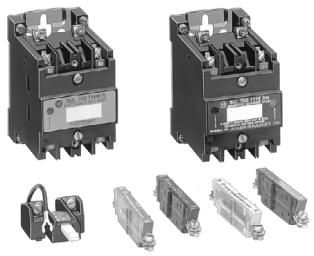
Note: Circuits are wired using #14 AWG wire.

Approximate Dimensions

Approximate Dimensions are shown in millimeters (inches). Approximate Dimensions are not intended to be used for manufacturing purposes.

	Length	Height	Depth
700-ZP100A1 (3 Relays, 9 Terminal Blocks):	342.9 (13-1/2)	152.4 (6)	101.6 (4)
700-ZP500A1 (3 Relays, 17 Terminal Blocks):	342.9 (13-1/2)	152.4 (6)	134.6 (5-5/16)
700-ZP800A1 (3 Relays, 23 Terminal Blocks):	400.0 (15-3/4)	152.4 (6)	165.1 (6-1/2)
700-ZP100Z24 (3 Relays, 9 Terminal Blocks):	342.9 (13-1/2)	152.4 (6)	121.9 (4-13/16)
700-ZP500Z24 (3 Relays, 17 Terminal Blocks):	342.9 (13-1/2)	152.4 (6)	154.9 (6-3/32)
700-ZP800Z24 (3 Relays, 23 Terminal Blocks):	400.0 (15-3/4)	152.4 (6)	188.0 (7-13/32)

Overview



Bulletin 700-R -RM

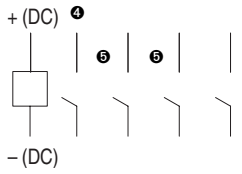
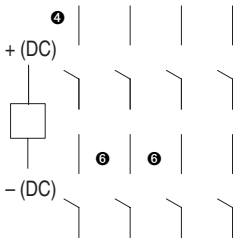
- Sealed Contacts
- Extremely Long Mechanical and Electrical Life
- Hazardous Locations Class 1, Div 2 Groups A, B, C, D
- Harsh Environments
- Suitable for Applications with Shock and Vibration
- High Reliability Circuit Integrity
- Conformity to Standards: NEMA B300, C600, NEMA P300
- Certifications: CSA Certified, UL Listed — Class 1, Div. 2, Groups A, B, C, D, CE Certified

Table Of Contents

Product Selection **230**
Modifications **232**
Specifications **233**
Approximate Dimensions **234**

Sealed Switch Relays

Product Selection

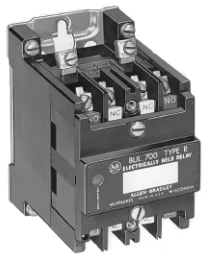
No. of Poles	Electrically Held ❶						
	Contacts		Contact Arrangement and Markings ❷	AC-Operated Relay Only		DC-Operated Relay Only	
				Open Type Without Enclosure	Type 1 General Purpose Enclosure	Open Type Without Enclosure	Type 1 General Purpose Enclosure
	N.O.	N.C.		Cat. No. ❸	Cat. No. ❸	Cat. No. ❸	Cat. No. ❸
0	0	0	Relay without Contact	700-R000⊗	700-R001⊗	700DC-R000⊗	700DC-R001⊗
2	2	0		700-R200⊗	700-R201⊗	700DC-R200⊗	700DC-R201⊗
	1	1		700-R110⊗	700-R111⊗	700DC-R110⊗	700DC-R111⊗
	0	2		700-R020⊗	700-R021⊗	700DC-R020⊗	700DC-R021⊗
4	4	0		700-R400⊗	700-R401⊗	700DC-R400⊗	700DC-R401⊗
	3	1		700-R310⊗	700-R311⊗	700DC-R310⊗	700DC-R311⊗
	2	2		700-R220⊗	700-R221⊗	700DC-R220⊗	700DC-R221⊗
	1	3		700-R130⊗	700-R131⊗	700DC-R130⊗	700DC-R131⊗
	0	4		700-R040⊗	700-R041⊗	700DC-R040⊗	700DC-R041⊗
6	6	0		700-R600⊗	700-R601⊗	700DC-R600⊗	700DC-R601⊗
	5	1		700-R510⊗	700-R511⊗	700DC-R510⊗	700DC-R511⊗
	4	2		700-R420⊗	700-R421⊗	700DC-R420⊗	700DC-R421⊗
	3	3		700-R330⊗	700-R331⊗	700DC-R330⊗	700DC-R331⊗
	2	4		700-R240⊗	700-R241⊗	700DC-R240⊗	700DC-R241⊗
	1	5		700-R150⊗	700-R151⊗	700DC-R150⊗	700DC-R151⊗
	0	6		700-R060⊗	700-R061⊗	700DC-R060⊗	700DC-R061⊗
8	8	0		700-R800⊗	700-R801⊗	700DC-R800⊗	700DC-R801⊗
	7	1		700-R710⊗	700-R711⊗	700DC-R710⊗	700DC-R711⊗
	6	2		700-R620⊗	700-R621⊗	700DC-R620⊗	700DC-R621⊗
	5	3		700-R530⊗	700-R531⊗	700DC-R530⊗	700DC-R531⊗
	4	4		700-R440⊗	700-R441⊗	700DC-R440⊗	700DC-R441⊗
	3	5		700-R350⊗	700-R351⊗	700DC-R350⊗	700DC-R351⊗
	2	6		700-R260⊗	700-R261⊗	700DC-R260⊗	700DC-R261⊗
	1	7		700-R170⊗	700-R171⊗	700DC-R170⊗	700DC-R171⊗
	0	8		700-R080⊗	700-R081⊗	700DC-R080⊗	700DC-R081⊗

⊗ Voltage Suffix Code

The Cat. No. as listed is incomplete. Select a voltage code from the table below to complete the Cat. No. Example: **Cat. No. 700-R000**⊗ becomes **Cat. No. 700-R000A24**. For other coil voltages, contact your local Allen-Bradley Sales Office.

Type of Relay	Hz	Coil Volts							
		24V	48V	110V	115-125V	120V	220V	230-250V	240V
AC	25	—	—	C11	—	C1	—	—	C2
	50	B24	B48	A1	—	—	A2	—	—
	60	A24	A48	—	—	A1	—	—	A2
DC	—	Z24	Z48	—	Z1	—	—	Z2	—

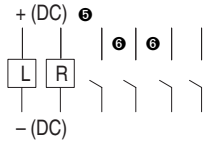
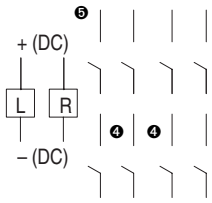
❶ 3-, 5- and 7-pole relays are available. Refer to your local Allen-Bradley Sales Office.
❷ Arrangement displays all N.O. contacts.
❸ All Cat. No. factory stocked.
❹ Polarity must be observed for DC voltage (700 DC) relays.
❺ Location of contacts in 2-pole relays.
❻ Location of contacts in 6-pole relays.



Bulletin 700-R Relay 4 Poles

Bulletin 700-R Relay 8 Poles

Type 1 Enclosure

No. of Poles	Contacts		Contact Arrangement and Markings ❷	Magnetic Latching ❶			
				AC-Operated Relay Only		DC-Operated Relay Only	
				Open Type Without Enclosure	Type 1 General Purpose Enclosure	Open Type Without Enclosure	Type 1 General Purpose Enclosures
	N.O.	N.C.		Cat. No. ❸	Cat. No. ❸	Cat. No. ❸	Cat. No. ❸
0	0	0	Relay without Contact	700-RM000⊗	700-RM001⊗	700DC-RM000⊗	700DC-RM001⊗
2	2	0		700-RM200⊗	700-RM201⊗	700DC-RM200⊗	700DC-RM201⊗
	1	1		700-RM110⊗	700-RM111⊗	700DC-RM110⊗	700DC-RM111⊗
	0	2		700-RM020⊗	700-RM021⊗	700DC-RM020⊗	700DC-RM021⊗
4	4	0		700-RM400⊗	700-RM401⊗	700DC-RM400⊗	700DC-RM401⊗
	3	1		700-RM310⊗	700-RM311⊗	700DC-RM310⊗	700DC-RM311⊗
	2	2		700-RM220⊗	700-RM221⊗	700DC-RM220⊗	700DC-RM221⊗
	1	3		700-RM130⊗	700-RM131⊗	700DC-RM130⊗	700DC-RM131⊗
	0	4		700-RM040⊗	700-RM041⊗	700DC-RM040⊗	700DC-RM041⊗
6	6	0		700-RM600⊗	700-RM601⊗	700DC-RM600⊗	700DC-RM601⊗
	5	1		700-RM510⊗	700-RM511⊗	700DC-RM510⊗	700DC-RM511⊗
	4	2		700-RM420⊗	700-RM421⊗	700DC-RM420⊗	700DC-RM421⊗
	3	3		700-RM330⊗	700-RM331⊗	700DC-RM330⊗	700DC-RM331⊗
	2	4		700-RM240⊗	700-RM241⊗	700DC-RM240⊗	700DC-RM241⊗
	1	5		700-RM150⊗	700-RM151⊗	700DC-RM150⊗	700DC-RM151⊗
	0	6		700-RM060⊗	700-RM061⊗	700DC-RM060⊗	700DC-RM061⊗
8	8	0		700-RM800⊗	700-RM801⊗	700DC-RM800⊗	700DC-RM801⊗
	7	1		700-RM710⊗	700-RM711⊗	700DC-RM710⊗	700DC-RM711⊗
	6	2		700-RM620⊗	700-RM621⊗	700DC-RM620⊗	700DC-RM621⊗
	5	3		700-RM530⊗	700-RM531⊗	700DC-RM530⊗	700DC-RM531⊗
	4	4		700-RM440⊗	700-RM441⊗	700DC-RM440⊗	700DC-RM441⊗
	3	5		700-RM350⊗	700-RM351⊗	700DC-RM350⊗	700DC-RM351⊗
	2	6		700-RM260⊗	700-RM261⊗	700DC-RM260⊗	700DC-RM261⊗
	1	7		700-RM170⊗	700-RM171⊗	700DC-RM170⊗	700DC-RM171⊗
	0	8		700-RM080⊗	700-RM081⊗	700DC-RM080⊗	700DC-RM081⊗

⊗ Voltage Suffix Code

The Cat. No. as listed is incomplete. Select a voltage code from the table below to complete the Cat. No. Example: **Cat. No. 700-RM000**⊗ becomes **Cat. No. 700-RM000A24**. For other coil voltages, contact your local Allen-Bradley Sales Office.

Type of Relay	Hz	Coil Volts							
		24V	48V	110V	115-125V	120V	220V	230-250V	240V
AC	25	—	—	C11	—	C1	—	—	C2
	50	B24	B48	A1	—	—	A2	—	—
	60	A24	A48	—	—	A1	—	—	A2
DC	—	Z24	Z48	—	Z1	—	—	Z2	—

❶ 3-, 5- and 7-pole relays are available. Refer to your local Allen-Bradley Sales Office.
❷ Arrangement displays all N.O. contacts.
❸ All Cat. No. factory stocked.
❹ Location of contacts in 6-pole relays.
❺ Polarity must be observed for DC voltage (700 DC) relays.
❻ Location of contacts in 2-pole relays.

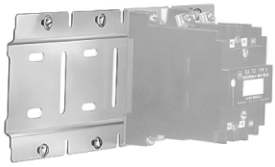
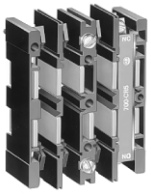
Bulletin 700-RM Relay

Sealed Switch Relays

Modifications

Description	Letter Designation	Manual Actuator Addition for Relay	Actuation Qty.
Manual Actuator A factory-installed manual actuator is available for manual energization of the relay coils. To order, replace the letters "**R**" or "**RM**" after the dash in the listed catalog number with the letters listed at right. Ratings 150V AC or DC maximum. Example: **Cat. No. 700-RM300A1** becomes **Cat. No. 700-RMLR300A1**.	RL	Type R	1
	RML	Type RM on Latch Coil	1
	RMR	Type RM on Reset Coil	1
	RMLR	Type RM on Latch and Reset Coil (2 manual actuators required)	2

Accessories for Bulletin 700-R, -RM Relays

	Description		Pkg. Qty.	Cat. No. ❶
	**Universal Mounting Strips** Simplifies panel layout. These indexed strips are easily cut to the required length and bolted, riveted, or spot-welded in place. Relays are installed adjacent to one another on the mounting strip with the captive mounting screws provided. Rows of relays on mounting strip form their own wiring trough.	4 Relays per Strip	5	700-MP4
		8 Relays per Strip	5	700-MP8
		12 Relays per Strip	5	700-MP12
		16 Relays per Strip	5	700-MP16
	**Front Deck** A front deck can be attached to Bulletin 700 2-, 3-, or 4-pole AC and DC Type R or RM relays.	Front Deck with one N.O. Contact Cartridge (700-R Relay)		700-RA10
		Front Deck with one N.C. Contact Cartridge (700-R Relay)		700-RA01
		Front Deck with one N.O. Contact Cartridge (700-RM Relay)		700-RB10
		Front Deck with one N.C. Contact Cartridge (700-RM Relay)		700-RB01
Cat. No. 700-CR5 *Cat. No. 700-CR6* *Cat. No. 700-CR9*	**Contact Cartridges** These cartridges are used to increase the number of poles of a relay. A dummy cartridge is also available to fill empty space not occupied by a contact cartridge. N.O. N.C.	N.O. Contact Cartridge - Green (700-R Relay)		700-CR5
		N.C. Contact Cartridge - Yellow (700-R Relay)		700-CR6
		N.O. Contact Cartridge - Blue (700-RM Relay)		700-CR7
		N.C. Contact Cartridge - Red (700-RM Relay)		700-CR8
		"DUMMY" Cartridge - Black (700-R and -RM Relays)		700-CR9
	Surge Suppressor When the circuit to a DC operating coil is opened, the inductive energy stored in the coil can generate very high transient voltages. With the addition of the appropriate surge suppressor, the stored energy is absorbed and dissipated limiting the voltage spikes. A surge suppressor is not required with AC 700-R or -RM relays because the AC operating coil transients are suppressed by a full wave rectifier connected to the coil.	12V DC (700-R Relay)	1	199-FSMA9
		12V DC (700-RM Relay)	2	
		24V DC (700-R Relay)	1	
		24V DC (700-RM Relay)	2	
		48V DC (700-R Relay)	1	
		48V DC (700-RM Relay)	2	
		115…125V DC (700-R Relay)	1	199-FSMA10
		115…125V DC (700-RM Relay)	2	
		230…250V DC (700-R Relay)	1	199-FSMA11
		230…250V DC (700-RM Relay)	2	
	Bulletin 700-PS Solid-State Timing Unit You can attach a Bulletin 700-PS solid-state timing unit to 4-pole 700-R or -RM relays. An adaptor kit, **Cat. No. 700-N26**, is required. See page 40-235 for description.			
	Bulletin 852S Solid-State Timing Unit You can attach a Bulletin 852S solid-state timing unit to 4-pole 700-R or -RM relays.			

❶ All Cat. Nos. are factory stocked.

Application Data – Because of the inherent characteristics of this device, the normally open contacts may close before the normally closed contacts open on energization and the normally closed contacts may close before the normally open contacts open on de-energization.
Note: For Type 700-RM, energizing both the latch and unlatch coil together will cause the relay to be energized and both latch and unlatch coils can be operated together continuously.

Ratings

AC Voltage						DC Voltage			
NEMA Rating Designation	Voltage		Make	Break	Continuous Carrying Current (A)	NEMA Rating Designation	Volts DC	Make/Break	Continuous Carrying Current (A)
B300	Up to 300V AC	120V 240V	30 15	3 1.5	5	NEMA P300	46…300	138 VA	5
C600	Above 300V AC	480V 600V	7.5 6.0	0.75 0.60	2.5		5…46	3 A	5

Maximum Allowable Off-State Leakage Current

Voltage	Maximum Off-State Leakage Current (mA)	Maximum Off-State Leakage Current (mA)
	Type R	Type RM
24V DC	23	8
24V AC 120V AC	23 5	8 2

Relay Data

Type		700-R	700-RM
Contact Arrangement		Up to 8 Poles, available in any combination of N.O. or N.C. contacts	Up to 8 Poles, available in any combination of N.O. or N.C. contacts
Contact Material		W (tungsten in a controlled gas atmosphere)	W (tungsten in a controlled gas atmosphere)
Coil Voltage Range		24…250V AC 24…250V DC	24…250V AC 24…250V DC
Coil Power	Sealed Voltage Range: –15… +10%	5.5 VA, 50/60 Hz 5.5 W DC	1.7 VA, 50/60 Hz (Latch or Unlatch) 1.7 W DC
	Inrush	5.5 VA, 50/60 Hz 5.5 W DC	1.7 VA, 50/60 Hz (Latch or Unlatch) 1.7 W DC
Pickup Time		30 ms	75 ms Min. Latch Pulse
Dropout Time		30 ms	75 ms Min. Unlatch Pulse
Operating Temperature		–40…+60°C (–40…+140°F)	–40…+60°C (–40…+140°F)
Mounting		Panel Mount	Panel Mount

Bulletin 700-R Operating Coils

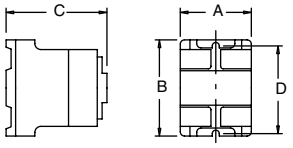
Bulletin 700-R Operating Coil

Coil Volts	Bulletin 700-R 2-…8-Pole AC		Bulletin 700-R 2-…8-Pole DC
	60 Hz	50 Hz	
24	77AB27	77AB27	77D152
48	77AB134	77AB134	77D166
110	77AB86	77AB86	—
115…125	—	—	77D155
120	77AB86	77AB86	—
208	—	—	—
220	77AB83	77AB83	—
240	77AB83	77AB83	—
230…250	—	—	77D156

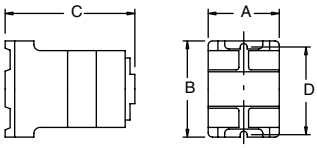
Sealed Switch Relays

Approximate Dimensions and Shipping Weights

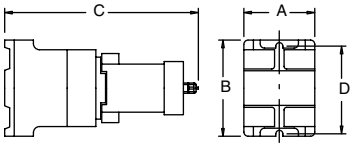
Approximate Dimensions in millimeters (inches) shown. Approximate Dimensions are not intended to be used for manufacturing purposes.



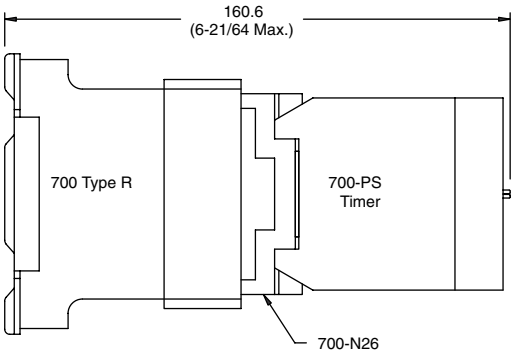
Bulletin 700-R400..., -RM400...



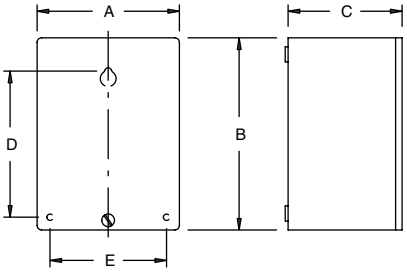
Bulletin 700-R800, -RM800...



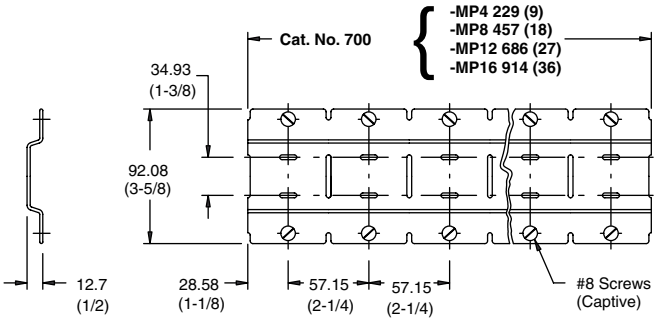
Bulletin 700-R with 852s timer



Bulletin 700-PS Timer Mounted on a 4-Pole Bulletin 700-R Relay Approximate Shipping Wt. 1.25 kg (2.75 lbs.)



Type 1 Enclosure



Universal Mounting Strip for Bulletin 700- P, -PH, -PK, -N, -R, -RM, -RT, -RTA Relays

Secure the mounting strip with 2 screws at each end relay position. Use a minimum of one screw at the 3rd, 5th, 7th, etc., relay positions. Alternate between upper and lower horizontal slots.

Bulletin 700-R, -RM Relays

Type of Relay		No. of Poles	Open Type Without Enclosures					Approx. Ship Wt. (kg) lbs.	Type 1 General Purpose Enclosure					Approx. Ship. Wt. kg (lbs.)
			Drawing Number	A Wide	B High	C Deep	D		A Wide	B High	C Deep	D	E	
R	Bulletin 700 and Bulletin 700DC	2...4	1	55.56 (2-3/16)	88.90 (3-1/2)	92.25 (3-3/8)	79.38 (3-1/8)	0.91 (2)	104.78 (4-1/8)	185.74 (7-5/16)	103.19 (4-1/16)	146.05 (5-3/4)	85.73 (3-3/8)	1.81 (4)
		5...8	2	55.56 (2-3/16)	88.90 (3-1/2)	111.13 (4-3/8)	79.38 (3-1/8)	1.02 (2-1/4)	112.71 (4-7/16)	228.60 (9)	120.65 (4-3/4)	206.38 (8-1/8)	92.08 (3-5/8)	2.49 (5)
R with Bulletin 852S Timer	Bulletin 700 and Bulletin 700DC	2...4	3	55.56 (2-3/16)	88.90 (3-1/2)	165.1 (6-1/2)	79.38 (3-1/8)	1.25 (2-3/4)	—	—	—	—	—	—
RM	Bulletin 700 and Bulletin 700DC	2...4	1	55.56 (2-3/16)	88.90 (3-1/2)	95.25 (3-3/8)	79.38 (3-1/8)	0.91 (2)	104.78 (4-1/8)	185.74 (7-5/16)	103.19 (4-1/16)	146.05 (5-3/4)	85.73 (3-3/8)	1.81 (4)
		5...8	2	55.56 (2-3/16)	89.90 (3-1/2)	111.13 (4-3/8)	79.38 (3-1/8)	1.02 (2-1/4)	112.71 (4-7/16)	228.60 (9)	120.65 (4-3/4)	206.38 (8-1/8)	92.08 (3-5/8)	2.49 (5)
RM with Bulletin 852S Timer	Bulletin 700 and Bulletin 700DC	2... 4	3	55.56 (2-3/16)	88.90 (3-1/2)	165.1 (6-1/2)	79.38 (3-1/8)	1.25 (2-3/4)	—	—	—	—	—	—

Solid-State Timer
Cat. No. 700-PSPA1

Bulletin 700-PS

- Solid-State Timer
- 600V AC Maximum
- 300V DC Maximum
- UL Listed, CSA Certified

Table Of Contents

Product Selection 235
Specifications 236
Approximate Dimensions 237

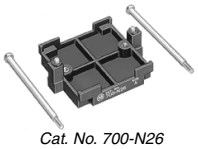
Bulletin 700-PS

Solid-State Timer
Cat. No. 700-PSPA1

Mode	Nominal Range ❶	Timing Relay with Self-Contained Potentiometer Unit	Timing Relay for Use with External Potentiometer Unit
		Cat. No. ❷	Cat. No. ❷
On-Delay	0.1…2 s 0.4…8 s 1.5…30 s 6…120 s	700-PSAA1 700-PSBA1 700-PSCA1 700-PSDA1	700-PSRAA1 700-PSRBA1 700-PSRCA1 700-PSRDA1
Off-Delay	0.1…2 s 0.4…8 s 1.5…30 s 6…120 s	700-PSPA1 700-PSRA1 700-PSTA1 700-PSUA1	700-PSRPA1 700-PSRRA1 700-PSRTA1 700-PSRUA1

Bulletin 700-PS — Accessories

Cat. No. 700-N25



Cat. No. 700-N26

Description			Cat. No. ❷
Adapter Plate — For mounting Bulletin 700-PS timers directly on a panel or on Bulletin 700-MP universal mounting strips.			700-N25
Adapter for Bulletin 700-R, -RM Relays Allows you to mount the Bulletin 700-PS timer on a 1- to 4-pole Bulletin 700-R or -RM relay.			700-N26
External Potentiometers for Remote Mounting	**Timing Range (s) ❹**	**Resistance (MΩ)**	**Cat. No. ❸ ❷**
	0.1…2	0.75	700-N35
	0.4…8	0.75	700-N35
	1.5…30	2.0	700-N36
	6…120	3.5	700-N37

❶ The maximum range may be 50% greater and the minimum range may be 50% less than the values specified.
❷ All Cat. Nos. are factory stocked
❸ This Cat. No. includes only the potentiometer. Order **Cat. No. 800T-N37** for the potentiometer operator and housing.
❹ The maximum time may be 50% longer and the minimum may be 50% shorter than the values specified.

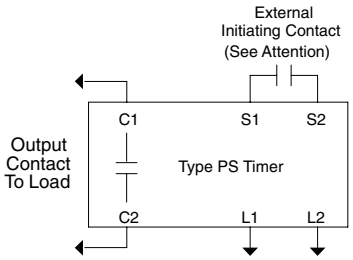
Bulletin 700-PS

Supply Voltage	110...120V AC, 50/60 Hz
Power Requirement	4 VA, 2.5 W
Output Contact Ratings	NEMA B600 and P300. See page 19.
Operating Temperature Range	–20…+60°C ambient (–4…+140°F)
Reset Time	20 ms
Repeat Accuracy, Constant Voltage and Temperature	±2% of setting or ±0.004 s, whichever is greater
Standards	NEMA B600, NEMA P300
Certifications	UL Listed, Class I, Division 2, Groups A, B, C, and D, CSA Certified

Operation

The timer must be energized continuously (L1-L2).
ON-Delay: When the initiating contact closes, timing begins. At time-out, the output contact closes.
OFF-Delay: When the initiating contact closes, the output contact closes instantly. When the initiating contact re-opens, timing begins. At time-out, the output contact re-opens.

Typical Wiring Diagram ❶



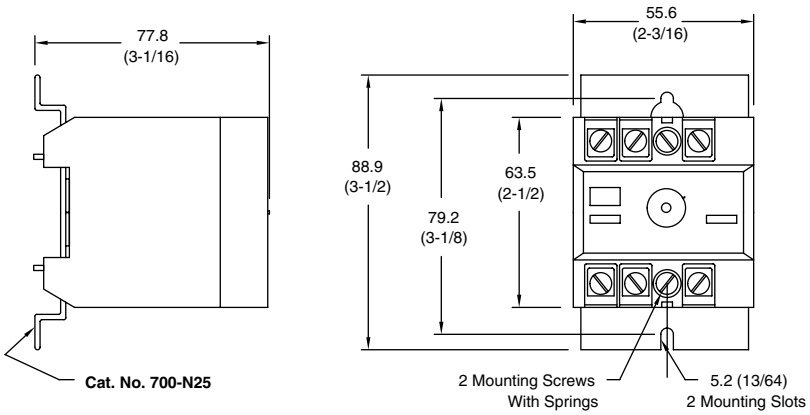
110/120V, 50/60 Hz

Attention — To avoid damage to timer, do not switch any load in addition to timing relay at terminals S1-S2. Do not apply an external voltage to terminals S1-S2.

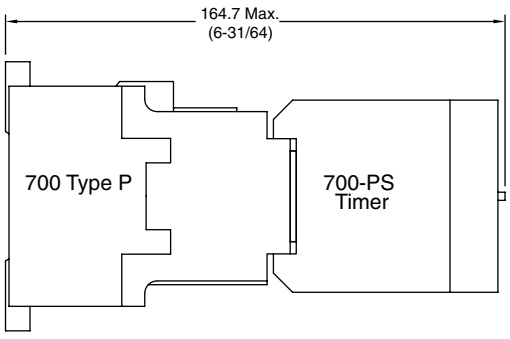
❶ Note: External Potentiometer units have R1, R2 terminals for connecting the potentiometer.

Approximate Dimensions are shown in millimeters (inches). Approximate Dimensions are not intended to be used for manufacturing purposes.

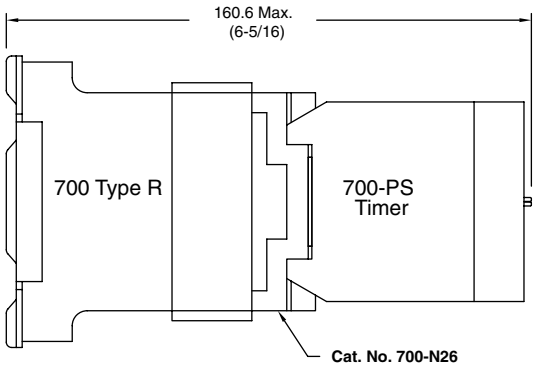
Bulletin 700-PS



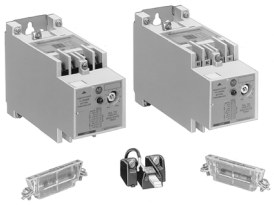
Bulletin 700-PS Timer Mounted on the Adapter Plate
Cat. No. 700-N25
Approximate Shipping Wt. 0.45 kg (1 lb.)



Bulletin 700-PS Timer Mounted on a 4-Pole
Bulletin 700-P or -PK, or 2-Pole Bulletin 700-PH Relay
Approximate Shipping Wt. 1.02 kg (2-1/4 lbs.)



Bulletin 700-PS Timer Mounted on a 4-Pole
Bulletin 700-R or -RM Relay
Approximate Shipping Wt. 1.25 kg (2-3/4 lbs.)



Bulletin 700-RTC

- Timing Functions
- 8 ON-Delay
- 8 OFF-Delay
- Timing Ranges
- Seconds: 0.05…2, 0.2…8, 0.4…30, 2…120
- Minutes: 0.015…1, 0.06…4, 0.25…16 and 1…64
- AC, 50/60 Hz or DC
- 600V AC Maximum
- 300V DC Maximum
- Relays with Fixed Time Delay
- Sealed Contacts
- Harsh Environments
- Hazardous Locations Class I, Div. 2, Groups A, B, C and D
- UL Listed, CSA Certified

Table of Contents

Product Selection 239
Accessories. 241
Specifications 242
Approximate Dimensions .242

Bulletin 700-RTC Relay – Relays with Provision for Instantaneous Contacts

Relays listed below have slots for two timed contacts and two instantaneous contacts. Unused slots are equipped with removable dummy cartridges.

Number of Contact Cartridges					Open Type Without Enclosure
Total	Instantaneous		Timed		Cat. No. ❶
	N.O.	N.C.	N.O.	N.C.	
0	0	0	0	0	700-RTC00000⊗
1	0	0	1	0	700-RTC00100⊗
	0	0	0	1	700-RTC00010⊗
2	0	0	2	0	700-RTC00200⊗
	1	0	1	0	700-RTC10100⊗
	0	1	1	0	700-RTC01100⊗
	0	0	1	1	700-RTC00110⊗
	1	0	0	1	700-RTC10010⊗
	0	1	0	1	700-RTC01010⊗
	0	0	0	2	700-RTC00020⊗
3	1	0	2	0	700-RTC10200⊗
	2	0	1	0	700-RTC20100⊗
	0	1	2	0	700-RTC01200⊗
	1	1	1	0	700-RTC11100⊗
	1	0	1	1	700-RTC10110⊗
	2	0	0	1	700-RTC20010⊗
	0	2	1	0	700-RTC02100⊗
	0	1	1	1	700-RTC01110⊗
	1	1	0	1	700-RTC11010⊗
	1	0	0	2	700-RTC10020⊗
	0	2	0	1	700-RTC02010⊗
	0	1	0	2	700-RTC01020⊗
4	2	0	2	0	700-RTC20200⊗
	1	1	2	0	700-RTC11200⊗
	2	0	1	1	700-RTC20110⊗
	0	2	2	0	700-RTC02200⊗
	1	1	1	1	700-RTC11110⊗
	2	0	0	2	700-RTC20020⊗
	1	1	0	2	700-RTC11020⊗
	0	2	1	1	700-RTC02110⊗
	0	2	0	2	700-RTC02020⊗

❶ All Cat. Nos. are factory stocked.

⊗ Voltage Suffix Code

The Cat. No. as listed is not complete. Select a voltage suffix code from the table below to complete the Cat. No. Example: **Cat. No. 700-RTC00100**⊗ becomes **Cat. No. 700-RTC00100U24**. For other voltages consult your local Allen-Bradley Sales Office.

Voltage	24V DC 24V AC, 50/60 Hz	120V DC 110/120V AC, 50/60 Hz	240V DC 220/240V AC, 50/60 Hz
Coil Code	U24	U1	U2

Contact Cartridges

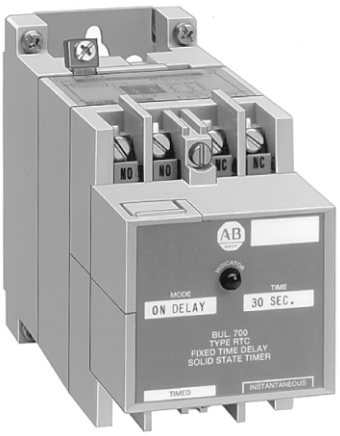
Description	Contacts	Cat. No.
Timed and Instantaneous	N.O. (Gray)	700-CRT5
	N.C. (Orange)	700-CRT6

Remote Potentiometer Provision (for Bulletin 700-RTCR Relays, 24V AC, 50/60 Hz, or 24V DC Only)

To order a Bulletin 700- RTC relay with remote potentiometer provision, add an **"R"** after the letters RTC of the selected Cat. No. from the above table and a **"U24"** coil code to the Cat. No. **Example:** 700-RTC**R**00000**U24**. Order potentiometer separately from page 41-241.

Bulletin 700-RTC Relays with Fixed Time Delay— Relays with Provision for Instantaneous Contacts

Relays listed below have slots for two timed and two instantaneous contacts. Unused slots are equipped with removable dummy cartridges.



Number of Contact Cartridges					Open Type Without Enclosure
Total	Timed		Instantaneous		Cat. No. ❷
	N.O.	N.C.	N.O.	N.C.	
0	0	0	0	0	700-RTC00❶0⊗
1	1	0	0	0	700-RTC10❶0⊗
	0	1	0	0	700-RTC20❶0⊗
2	2	0	0	0	700-RTC40❶0⊗
	1	0	1	0	700-RTC11❶0⊗
	1	0	0	1	700-RTC12❶0⊗
	1	1	0	0	700-RTC30❶0⊗
	0	1	1	0	700-RTC21❶0⊗
	0	1	0	1	700-RTC22❶0⊗
	0	2	0	0	700-RTC50❶0⊗
3	2	0	1	0	700-RTC41❶0⊗
	1	0	2	0	700-RTC14❶0⊗
	2	0	0	1	700-RTC42❶0⊗
	1	0	1	1	700-RTC13❶0⊗
	1	1	1	0	700-RTC31❶0⊗
	0	1	2	0	700-RTC24❶0⊗
	1	0	0	2	700-RTC15❶0⊗
	1	1	0	1	700-RTC32❶0⊗
	0	1	1	1	700-RTC23❶0⊗
	0	2	1	0	700-RTC51❶0⊗
	0	1	0	2	700-RTC25❶0⊗
	0	2	0	1	700-RTC52❶0⊗
4	2	0	2	0	700-RTC44❶0⊗
	2	0	1	1	700-RTC43❶0⊗
	1	1	2	0	700-RTC34❶0⊗
	2	0	0	2	700-RTC45❶0⊗
	1	1	1	1	700-RTC33❶0⊗
	0	2	2	0	700-RTC54❶0⊗
	1	1	0	2	700-RTC35❶0⊗
	0	2	1	1	700-RTC53❶0⊗
	0	2	0	2	700-RTC55❶0⊗

❶ Replace the ❶ in the Cat. No. with the appropriate letter and numbers to indicate the operating mode and the fixed time delay value. Refer to operating mode table.
❷ All Cat. Nos. are factory stocked.

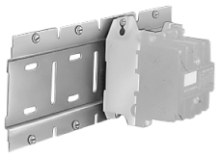
Digit	Operating Mode	Fixed Time Delay
S Z	On-Delay – s Off-Delay – s	**Seconds –**Two digits indicating the fixed time delay in seconds. Three digits indicating the fixed time delay (first digit indicates seconds, next two digits indicate 1/100 seconds).
Y I	On-Delay – Min. Off-Delay – Min.	**Minutes –**Two digits indicating the fixed time delay in minutes. Three digits indicating the fixed time delay (first digit indicates minutes, next two digits indicate 1/100 minutes).

Examples: **Cat. No. 700-RTC00Y20**0U1 is for a relay without contact cartridges. **"Y20"** indicates an On-Delay timer with a 20 minute fixed time delay. This is a "standard relay." Order the contact cartridges separately. **Cat. No. 700-RTC42S02**0U1 is for a relay with 2 N.O. cartridges in the timed position and 1 N.C. cartridge in the instantaneous position. **"S02"** indicates an On-Delay timer with a 2 second fixed time delay.

⊗ Voltage Suffix Code

The Cat. No. as listed is not complete. To complete the Cat. No., add a coil code selected from the table below.

Voltage	24V DC—24V AC, 50/60 Hz	120V DC—110/120V AC, 50/60 Hz	240V DC—220/240V AC, 50/60 Hz
Coil Code	U24	U1	U2

	Description	Cartridge Type	Color	Cat. No. ❺
Cat. No. 700-CRT5 Cat. No. 700-CRT6 Cat. No. 700-CR9	**Contact Cartridges –** These cartridges are used to add contacts to timing relays having unused slots. The N.O., N.C., and "Dummy" cartridges are interchangeable and can be used in timed or instantaneous contact slots. "Dummy" cartridges should be placed in unused cartridge slots to guard against entrance of foreign material.	Normally Open	Gray	700-CRT5
		Normally Closed	Orange	700-CRT6
		"Dummy" Cartridge	Black	700-CR9
Cat. No. 800MR-N37	**External Potentiometer –** The potentiometer units listed are recommended for timers with remote potentiometer provision. Refer to catalog section on Bulletin 800T or 800M for general construction features. **Connection Cable –** Use shielded twisted pair cable, maximum of 50 feet. Recommended cable (or equivalent): UL style 2517, having two #18 stranded conductors with aluminum mylar foil shield and #20 drain wire. Rated 150°C, FR-1, 300 volts.	Oiltight ❶		800T-U90
		Small Oiltight – Round ❷❸		800MR-N37
		Small Oiltight – Square ❷❹		800MS-N37
	ATTENTION – If the recommended potentiometer and cable are not used, be certain that the potentiometer and cable wiring (R1-R2 circuit in Figure 3) is insulated from ground and circuit common for 300V RMS or greater.			
	NEMA Type 1 Enclosure – Suitable for Bulletin 700-RTC timing relays.			700-N31
	**Universal Mounting Strips –** These strips are easily cut to the required length and bolted, riveted or spotwelded in place. Relays are installed adjacent to one another on the mounting strip with the captive mounting screws provided. 5 strips/package.	**Relays Per Strip**	**Pkg. Qty.**	
		4	5	700-MP4
		8	5	700-MP8
		12	5	700-MP12
		16	5	700-MP16

❶ Legend plate, **Cat. No. 800T-X609**, must be specified when ordering.
❷ Add suitable 400 KΩ potentiometer.
❸ Does not include legend plate. Refer to page 10-289, publication A113.
❹ Does not include legend plate. Contact your local Allen-Bradley Sales Office.
❺ All Cat. Nos. are factory stocked.

Voltage and Power Requirements

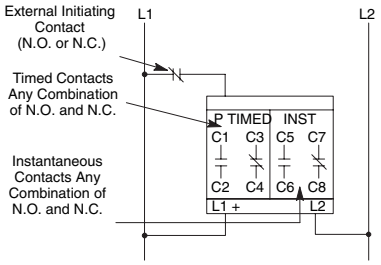
AC Voltage +10% –15% 50/60 Hz	Total Power Required	Initiate Terminal (P) Power	Maximum Allowable Leakage Current	Coil Code
24V AC	8 VA	4 VA	10 mA	U24
110/120V AC	9 VA	4 VA	2.4 mA	U1
220/240V AC	11 VA	5 VA	2.4 mA	U2

DC Voltage +10% –20%	Total Power Required	Initiate Terminal (P) Power	Maximum Allowable Leakage Current	Coil Code
24V DC	10 W	5 W	10 mA	U24
120V DC	11 W	5 W	2.4 mA	U1
240V DC	12 W	5 W	2.4 mA	U2

Type	700-RTC	
Contact Rating (See page 29)	NEMA B600 600V AC, 5 A NEMA P300 300V DC, 5 A	
Contact Arrangement	1…4 poles. Max. of 2 timed and 2 instantaneous. Available in any combination of N.O. and N.C. contacts	
Contact Material	W (tungsten in a controlled gas atmosphere)	
Operating Mode	Convertible to On-Delay or Off-Delay	
Timing Range	0.05…64 min.	
Reset Time	25 ms	
Repeat Accuracy	±1% (or ±50 ms) at constant voltage and temperature	
Mounting	Panel or Strip Mount	
Surge Suppression	Not required. Timers have internal suppression	
Standards	NEMA B600, NEMA P300	
Certifications	UL Listed, File E10314, Guide NOIV Suitable for use in Class I, Division 2, Groups A, B, C, and D CSA Certified, File LR11924	
Maximum Allowable Leakage Current	24V AC/DC 110/120V AC, 220/240V AC, 120/240V DC	10 mA 2.4 mA
Ambient Temperature ❶ Operating: Storage:	 –20…+60°C (–4…+140°F) –20…+60°C (–4…+140°F)	

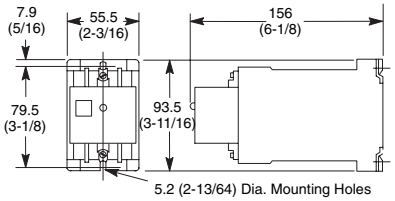
❶ Continuous duty units placed close to each other (3 in a row) have a temperature range of –20…+45°C (–4…+113°F) or should have air circulated around the units. Approximate space of 3/4 in. on all sides is needed.

Typical Wiring Diagram

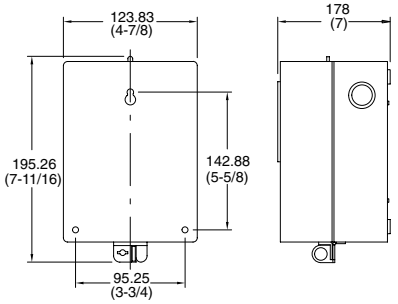


Approximate Dimensions

Approximate Dimensions are shown in millimeters (inches). Approximate Dimensions are not intended to be used for manufacturing purposes.



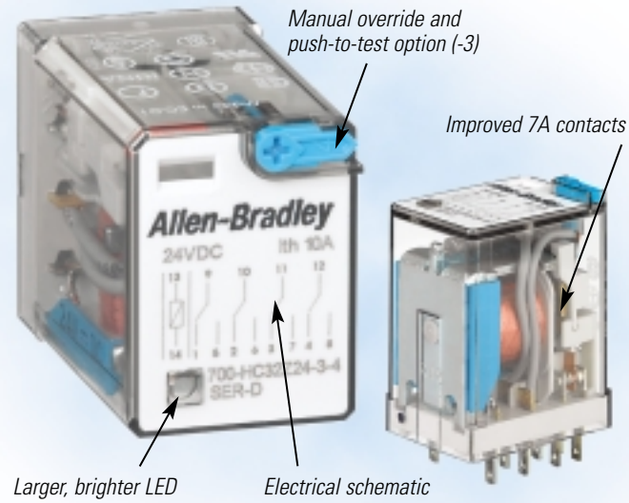
Approximate Shipping Weight 0.92 kg (2.1 lb.)



NEMA Type 1 Enclosure for RTC Relays
Approximate Shipping Weight 1.26 kg (2.8 lb.)

Interposing Relays
New Cost-Saving Relay Design

Rockwell Automation is introducing a new and improved Allen-Bradley 700-HC "Ice Cube" General Purpose Relay. This 4-pole plug-in relay has been redesigned to meet your low energy switching application needs. Along with the 700-HC, Allen-Bradley is offering a new, space-saving 700-HP printed circuit board (PCB) "Pin" style relay.



700-HC Series D

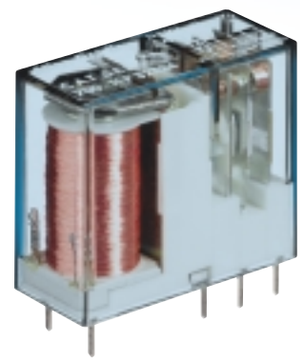
700-HC Series D

- Cost-reduced design
- Improved low-energy switching capability
- Increased the I_{th} switching capability from 5 A … 7 A
- Same Allen-Bradley relay family appearance on faceplate
- Incorporated manual override lever (-3 option) with the existing push-to-test button
- New 700-HC Series A, 2-pole, 10 A version is now available with silver contacts

New!

700-HP PCB "Pin" Style

- PCB or socket mountable
- 5 mm Pin spacing available in a 2-pole, 8 A design



700-HP PCB "Pin" Style

700-A Plug and Play Modules

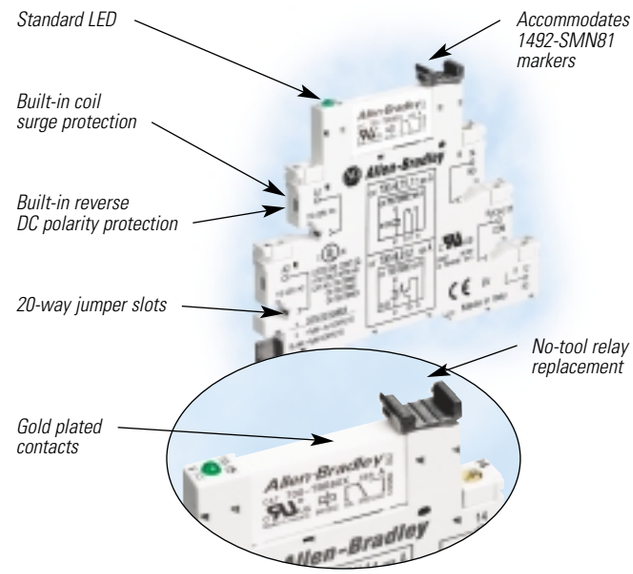
- Module mounted within sockets
- Available as surge suppression, timing and LED modules
- Modules compatible with 700-HN104 socket (for 700-HC relay)
- Modules compatible with 700-HN123 socket (for 700-HP relay)
- Modules compatible with 700-HN153 socket (for 700-HB relay)

700-A Plug and Play Module

Coil and Contact Suppression Sockets

- 700-HN104 (for 700-HC relay), 700-HN123 (for 700-HP relay)
- 12 A, 300V AC rating
- Able to insert optional plug and play 700-A modules

Terminal Block Relays
With Reliable Gold Plated Contacts



- Ensures corrosion will not form on the contact surface over time.
- Switches low energy loads reliably as low as 8V, 2.5 mA.
- Ideal for very low energy logic switching applications such as TTL drive enables and low energy I/O Cards such as Allen-Bradley 1734, 1746, 1756, 1764, 1771, 1791 and 1792 modules.

Relays and Timers – Global Products You Can Trust

Terminal Block Relay
Product Profile
Pub. No. 700-PP012B-EN-P

General Purpose Relays
Product Profile
Pub. No. 700-PP010A-EN-P

General Purpose Timers
Product Profile
Pub. No. 700-PP011A-EN-P

Gold Plated Contacts
Product Profile
Pub. No. 700-PP015A-EN-P

Interposing Relays
Product Profile
Pub. No. 700-PP014A-EN-P

Solid State Relays
Product Profile
Pub. No.
700SSR-PP001A-EN-P

Get It Now!

Three ways to get more information:

- View publications online at: www.ab.com/manuals/rt
- Order publications online at:
  www.the automationbookstore.com
- Contact your local Allen-Bradley distributor

www.rockwellautomation.com

Corporate Headquarters
Rockwell Automation, 777 East Wisconsin Avenue, Suite 1400, Milwaukee, WI, 53202-5302 USA, Tel: (1) 414.212.5200, Fax: (1) 414.212.5201

Headquarters for Allen-Bradley Products, Rockwell Software Products and Global Manufacturing Solutions
Americas: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444
Europe/Middle East/Africa: Rockwell Automation SA/NV, Vorstlaan/Boulevard du Souverain 36, 1170 Brussels, Belgium, Tel: (32) 2 663 0600, Fax: (32) 2 663 0640
Asia Pacific: Rockwell Automation, 27/F Citicorp Centre, 18 Whitfield Road, Causeway Bay, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846

Headquarters for Dodge and Reliance Electric Products
Americas: Rockwell Automation, 6040 Ponders Court, Greenville, SC 29615-4617 USA, Tel: (1) 864.297.4800, Fax: (1) 864.281.2433
Europe/Middle East/Africa: Rockwell Automation, Brühlstraße 22, D-74834 Elztal-Dallau, Germany, Tel: (49) 6261 9410, Fax: (49) 6261 17741
Asia Pacific: Rockwell Automation, 55 Newton Road, #11-01/02 Revenue House, Singapore 307987, Tel: (65) 6356-9077, Fax: (65) 6356-9011

Publication 700-SG003B-EN-P — June, 2002
Supercedes 700-SG003A-EN-P — May, 2001

Copyright © 2002 Rockwell Automation, Inc. All rights reserved. Printed in USA.